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## ***Chapter 4***



# ***Toxics Release Inventory Data for Textile Mill Products (SIC Code 22)***

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## **A Look at the Textile Mill Products Industry (SIC Code 22)**

Textile mills (SIC code 22) prepare fiber and produce yarn, thread, braids, twine, and cordage. They manufacture various fabrics—broadwoven, narrow woven, and knit. Facilities in this sector dye and finish fiber, yarn, fabrics, and knit apparel. They also coat and treat fabrics. Facilities that manufacture knit apparel and other finished products from their own yarn are classified in this sector. Broadwoven fabrics are generally more than 12 inches wide, and narrow woven fabrics less than 12 inches wide. The latter category includes, for example, fabrics for the production of men's ties. Miscellaneous products of this sector (SIC code 229) include non-rubberized coated fabrics, tire cord and fabrics, and other goods. Box 4-1 lists Standard Industrial Classification (SIC) codes and their designations for this sector. In TRI, SIC codes are given as reported by the facilities; these may differ from information in economic and other data collections.

Textile mills constitute one of the smaller segments of the United States manufacturing economy. In 1996, textile mills shipped products valued at \$80.24 billion, up slightly from \$79.87 billion in 1995 (both in current dollars). Employment in SIC code 22 was 576,000 in 1996. Textile mill employment declined steadily from 1988 to 1991. Although employment in this sector fluctuated in the mid-1990s, the 1996 level was the lowest recorded throughout the 1988-1996 period.

Knitting mills (SIC code 225) accounted for about one-fourth of the economic activity in this sector in 1996. Knitting mills had \$19.52 billion in shipments and employed 169,000. A number of other industry groups contributed roughly equal amounts to the sector's output, as measured in value of shipments. Yarn and thread mills (SIC code 228), carpets and rugs (SIC code 227), broadwoven synthetic fabric mills (SIC code 222), and miscellaneous textile goods (SIC code 229) all had shipments valued at approximately \$10 billion to \$13 billion. Textile mill production rose 10.6% from 1989 to 1996, compared to an increase of 17.6% for all U.S. manufacturing (see Chapter 1, Table 1-10).



## Chapter 4 — TRI Data for Textile Mill Products

**Box 4-1. SIC Code 22, Textile Mill Products: Codes and Classifications**

SIC Code	Industry Description
<b>221 Broadwoven Fabric Mills, Cotton</b>	
2211 Broadwoven Fabric Mills, Cotton	Weaving of fabrics more than 12 inches wide, wholly or chiefly of cotton.
<b>222 Broadwoven Fabric Mills, Manmade Fiber and Silk</b>	
2221 Broadwoven Fabric Mills, Manmade Fiber and Silk	Weaving of fabrics more than 12 inches wide, wholly or chiefly of silk and manmade fibers including glass.
<b>223 Broadwoven Fabric Mills, Wool (Including Dyeing and Finishing)</b>	
2231 Broadwoven Fabric Mills, Wool (Including Dyeing and Finishing)	Weaving of fabrics more than 12 inches wide, wholly or chiefly of wool, mohair, or similar animal fibers. Dyeing and finishing all woven wool fabrics. Dyeing wool, tops, or yarn. Shrinking and sponging of wool goods for the trade.
<b>224 Narrow Fabric and Other Smallwares Mills: Cotton, Wool, Silk, and Manmade Fiber</b>	
2241 Narrow Fabric and Other Smallwares Mills: Cotton, Wool, Silk, and Manmade Fiber	Weaving or braiding narrow fabrics of cotton, wool, silk, and manmade fibers (including glass). Manufacture of fabric-covered elastic yarn or thread.
<b>225 Knitting Mills</b>	
2251 Women's Full-Length and Knee-Length Hosiery, Except Socks	Knitting, dyeing, or finishing women's and misses' full-length and knee-length hosiery (except socks) and panty hose.
2252 Hosiery, nec*	Knitting, dyeing, or finishing miscellaneous hosiery.
2253 Knit Outerwear Mills	Knitting outerwear from yarn. Manufacturing outerwear from knit fabrics produced in the same establishment.
2254 Knit Underwear and Nightwear Mills	Knitting underwear and nightwear from yarn. Manufacturing underwear and nightwear from knit fabrics produced in the same establishment.
2257 Weft Knit Fabric Mills	Knitting weft (circular) fabrics. Dyeing or finishing weft knit fabrics.
2258 Lace and Warp Knit Fabric Mills	Knitting, dyeing, or finishing warp (flat) knit fabrics. Manufacturing, dyeing, or finishing lace goods.
2259 Knitting Mills, nec*	Knitting gloves and other miscellaneous articles, including bedspreads, curtains, and towels.
<b>226 Dyeing and Finishing Textiles, except Wool, Fabrics and Knit Goods</b>	
2261 Finishers of Broadwoven Fabrics of Cotton	Finishing cotton broadwoven fabrics, either purchased or on a commission basis. (Includes bleaching, dyeing, printing, shrinking, and chemical finishing for water repellency, fire resistance, and mildew proofing.)
2262 Finishers of Broadwoven Fabrics of Manmade Fiber and Silk	Finishing manmade fiber and silk broadwoven fabrics, either purchased or on a commission basis (as above).
2269 Finishers of Textiles, nec*	Dyeing and finishing of miscellaneous textiles (purchased or on commission), including raw stock, yarn, braided goods, and narrow fabrics.
<b>227 Carpets and Rugs</b>	
2273 Carpets and Rugs	Manufacture of woven, tufted, and other carpets and rugs, such as art squares, floor mattings, and needle punch carpeting. Manufacture of door mats and mattings from textile materials or from twisted paper, grasses, sisal, rags, and other materials.
<b>228 Yarn and Thread Mills</b>	
2281 Yarn Spinning Mills	Spinning yarn wholly or chiefly of cotton, manmade fibers, silk, wool, mohair, or similar animal fibers.
2282 Yarn Texturizing, Throwing, Twisting, and Winding Mills	Texturizing, throwing, twisting, winding, or spooling yarns or manmade fiber filaments, purchased or on commission.
2284 Thread Mills	Manufacture of thread, including handicraft threads.

\*nec: not elsewhere classified; these are generally referred to as "miscellaneous" products in their categories.



Box 4-1. SIC Code 22, Textile Mill Products: Codes and Classifications, Continued

SIC Code	Industry Description
<b>229 Miscellaneous Textile Goods</b>	
2295 Coated Fabrics, Not Rubberized	Manufacture of coated, impregnated, or laminated textiles. Finishing of textiles, such as varnishing and waxing.
2296 Tire Cord and Fabrics	Manufacture of cord and fabric for use in reinforcing rubber tires, industrial belting, fuel cells, and similar uses.
2297 Nonwoven Fabrics	Manufacture of nonwoven fabrics (by bonding or interlocking of fibers) by mechanical, chemical, thermal, and/or solvent means.
2298 Cordage and Twine	Manufacture of rope, cable, cordage, twine, and related products.
2299 Textile Goods, nec*	Manufacture of miscellaneous textile goods, including goods of linen, jute, or felt; padding and upholstery filling; and recovered fibers and flock. Processing textile fibers for spinning, such as scouring and carbonizing wool or combing and converting wool tow to top.

\*nec: not elsewhere classified; these are generally referred to as "miscellaneous" products in their categories.

Unlike some sectors such as pulp and paper milling, where integrated manufacturing processes and materials are common, textile mills and related establishments generally engage in one process or produce one product. Mills may weave cotton or synthetic fabrics, but seldom do both. Some mills spin yarn, but do not weave. Mills that spin and weave may not dye or finish their fabrics. Dyeing and finishing plants may process purchased materials, although many process fabrics for the mills on a commission basis.

Processes in textile milling begin with cleaning, carding and combing, and reblending staples (natural fibers) before spinning them into yarn. Synthetic fibers do not require these preliminary steps, but spinning processes are similar for both

natural and manmade fibers. Yarns are then woven or knit into fabrics. Finishing, also known as wet processing, may be mechanical, chemical, or both. This may include scouring and bleaching to prepare for further finishing steps such as dyeing, treating (for example, durable-press treatment), or coating. Finishing (industries in SIC code 226) and coating (SIC code 2295) make up the majority of the sector's TRI reporting.

Chemicals used in finishing textile products include wetting and cleaning agents, surfactants, and others with functional roles in processing, plus substances such as dyes and finishes that are intended to remain on the processed fibers and fabrics. In bleaching processes, hydrogen peroxide has largely replaced sodium hypochlorite and sodium chlorite.

#### Sources

- Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual*, 1987: Standard Industrial Classification (SIC) codes and industry descriptions.
- U.S. *Industry & Trade Outlook '98*, DRI/McGraw Hill, Standard & Poor's, and U.S. Department of Commerce, International Trade Administration, 1998: economic analyses, also provides some information on environment and industrial processes for selected industries.
- U.S. Census Bureau, *1996 Annual Survey of Manufactures: Statistics for Industry Groups and Industries*, M96(AS)-1, February 1998 <<http://www.census.gov/prod/www/titles.html#mm>>: value of shipments and employment. Supplemental data from U.S. Census Bureau <<http://www.census.gov>> for some industries.
- U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance, Office of Compliance, *Profile of the Textile Industry*, Sector Notebook project, EPA/310-R-97-009, September 1997 <<http://es.epa.gov/oeca/sector/index.html>>: industry processes and technologies, pollutant sources, and selected economic data.
- McGraw-Hill *Encyclopedia of Science and Technology*, 8th ed., 1997: industry processes and technologies.



## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-1. Summary of TRI Information by 4-digit SIC Code, 1996: Textile Mill Products, SIC Code 22**

Total On- and Off-site Releases Rank	Total Production- related Waste Rank	SIC Code	Industry	Total Facilities Number	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds
8	13	2211	Broadwoven Fabric Mills, Cotton	9	19	0	343,254	250	343,504
5	8	2221	Broadwoven Fabric Mills, Manmade	8	22	0	466,466	48,713	515,179
13	12	2231	Broadwoven Fabric Mills, Wool	13	25	0	145,622	6,322	151,944
22	24	2251	Women's Hosiery, Except Socks	3	3	0	181	0	181
23	18	2252	Hosiery, nec*	4	4	0	2	0	2
18	20	2253	Knit Outerwear Mills	8	13	0	19,595	12	19,607
24	21	2254	Knit Underwear Mills	1	1	0	0	0	0
17	16	2257	Weft Knit Fabric Mills	3	3	0	40,011	0	40,011
15	15	2258	Lace & Warp Knit Fabric Mills	3	3	0	105,565	0	105,565
21	22	2259	Knitting Mills, nec*	1	2	0	0	7,395	7,395
10	10	2261	Finishing Plants, Cotton	18	34	1	219,065	0	219,065
9	4	2262	Finishing Plants, Manmade	19	34	0	289,444	42,763	332,207
3	2	2269	Finishing Plants, nec*	31	67	5	1,482,755	5	1,482,760
6	5	2273	Carpets & Rugs	35	59	9	413,221	5,813	419,034
20	23	2281	Yarn Spinning Mills	2	2	1	12,300	0	12,300
16	19	2282	Throwing & Winding Mills	5	5	2	42,197	0	42,197
4	6	2284	Thread Mills	5	9	0	1,120,795	0	1,120,795
1	1	2295	Coated Fabrics, Not Rubberized	44	158	6	9,908,417	236,305	10,144,722
7	9	2296	Tire Cord & Fabrics	11	25	2	334,448	59,102	393,550
12	7	2297	Nonwoven Fabrics	9	12	0	166,120	0	166,120
14	17	2298	Cordage & Twine	2	5	0	106,331	0	106,331
11	11	2299	Textile Goods, nec*	17	27	3	174,596	14,066	188,662
2	3		Multiple within SIC Code 22	54	120	5	1,455,976	41,402	1,497,378
19	14		Invalid SIC Code within SIC Code 22	2	5	1	19,021	0	19,021
			Total for SIC Code 22	307	657	35	16,865,382	462,148	17,327,530

**Note:** **On-site Releases** from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). Facilities/forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility reported incorrectly under SIC code 2269 for 1996. The facility should have reported under SIC code 2869. The incorrectly reported amounts were the following: 51,735 pounds of total releases, 4,437,287 pounds of other on-site waste management, 61,342 pounds of transfers off-site for further waste management and 4,552,414 pounds of total production-related waste. Another facility incorrectly reported 393,101 pounds of total releases under SIC code 2269. The correct amount is 42,493 pounds. Accounting for these two facility errors, the total releases rank of SIC code 2269 changes from 3 to 4. Another facility incorrectly reported 10,679,852 pounds of other on-site waste management and total production-related waste under SIC code 2269. The correct amount is 0 pounds.

\*nec: not elsewhere classified.

Noncresylic surfactants have similarly been substituted for cresol-based surfactants in surfactants in mercerization processes that enhance luster and smoothness. Dyes may be reactive (reacting with fiber molecules to form chemical bonds), or direct (not requiring an affixing agent). Dyes for polyesters are disperse (requiring dye carriers, pressure, and heat). Printing operations typically rely on resin binders to apply pigments to fibers; solvents transport the resin-pigment mixture to the chemically treated fiber surface. Dyeing and printing processes may involve other chemical aids (to speed or retard dye penetration, for example), as well as after-treatment to prevent fading. Polyvinyl

and urea-formaldehyde resins are applied as stiffeners in some fabrics. Fabrics may also be treated to obtain fire-retardant or water-repellent characteristics.

## 1996 TRI Data for Textile Mill Products

Table 4-1 summarizes TRI reporting by the textile mills sector for 1996. Textile mill products industries submitted 657 forms in 1996. Of these, 35 were Form A certification statements, certifying that a facility's total annual reportable amount of a



Table 4-1. Summary of TRI Information by 4-digit SIC Code, 1996: Textile Mill Products, SIC Code 22, Continued

SIC Code	Industry	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
2211	Broadwoven Fabric Mills, Cotton	10,037	152,400	506,198	0
2221	Broadwoven Fabric Mills, Manmade	102,619	168,920	853,636	0
2231	Broadwoven Fabric Mills, Wool	388,371	25,807	552,119	0
2251	Women's Hosiery, Except Socks	0	0	181	0
2252	Hosiery, nec*	0	108,891	109,011	0
2253	Knit Outerwear Mills	23,000	17,738	62,547	0
2254	Knit Underwear Mills	0	24,153	24,153	0
2257	Weft Knit Fabric Mills	56,798	72,293	119,259	0
2258	Lace & Warp Knit Fabric Mills	495	14,000	119,297	0
2259	Knitting Mills, nec*	6,800	38	14,233	0
2261	Finishing Plants, Cotton	141,048	424,132	818,995	0
2262	Finishing Plants, Manmade	5,087,269	79,604	5,499,715	0
2269	Finishing Plants, nec*	20,326,972	927,188	22,365,755	0
2273	Carpets & Rugs	651,381	265,252	1,388,550	0
2281	Yarn Spinning Mills	0	0	12,300	0
2282	Throwing & Winding Mills	0	19,144	73,788	0
2284	Thread Mills	77,022	160,564	1,309,328	0
2295	Coated Fabrics, Not Rubberized	9,895,645	2,414,583	22,453,748	0
2296	Tire Cord & Fabrics	447,621	19,696	829,926	490
2297	Nonwoven Fabrics	871,039	4,711	1,043,510	0
2298	Cordage & Twine	0	3,069	109,400	0
2299	Textile Goods, nec*	352,045	94,319	635,610	0
	Multiple within SIC Code 22	3,475,454	754,947	5,562,785	468
	Invalid SIC Code within SIC Code 22	126,484	0	145,023	200
	Total for SIC Code 22	42,040,100	5,751,449	64,609,067	1,158

**Note:** **On-site Releases** from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). Facilities/forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility reported incorrectly under SIC code 2269 for 1996. The facility should have reported under SIC code 2869. The incorrectly reported amounts were the following: 51,735 pounds of total releases, 4,437,287 pounds of other on-site waste management, 61,342 pounds of transfers off-site for further waste management and 4,552,414 pounds of total production-related waste. Another facility incorrectly reported 393,101 pounds of total releases under SIC code 2269. The correct amount is 42,493 pounds. Accounting for these two facility errors, the total releases rank of SIC code 2269 changes from 3 to 4. Another facility incorrectly reported 10,679,852 pounds of other on-site waste management and total production-related waste under SIC code 2269. The correct amount is 0 pounds.

\***nec:** not elsewhere classified.

TRI chemical was less than 500 pounds for the year and that the facility did not manufacture, process, or otherwise use more than 1 million pounds. This represented 5.3% of all submissions from this industry, which was about half the percentage (10.1%) of Form As submitted for all industries in 1996. (The Form A certification statement is explained in Chapter 1.)

The textile mill products industry that submitted the most forms was coated fabrics (SIC code 2295). This industry submitted 158 forms, one-quarter of the sector's total. Forms that reported more than

one SIC code in SIC code 22 to describe their operations (explained below) was the second largest group, with 120 forms. Miscellaneous finishing plants (SIC code 2269) was third, with 67 forms.

Some facilities in this sector manufacture products classified in distinct, but related SIC codes. A few textile mills weave both cotton and synthetic fabrics; such facilities would report SIC codes 2211 (broadwoven fabric mills, cotton) and 2221 (broadwoven fabric mills, manmade) to describe their activities. Other facilities might finish manmade fabrics (SIC code 2262) and also perform



operations such as bleaching and finishing raw stock, yarn, and narrow fabrics (SIC code 2269, miscellaneous finishing plants). Such facilities also may report multiple SIC codes on their TRI forms. (Box 1-5 in Chapter 1 further explains reporting of multiple SIC codes and its affect on the analyses presented in the TRI data release.)

As shown in Table 4-1, on- and off-site releases in the textile mills sector totaled 17.3 million pounds in 1996. Production of coated fabrics (SIC code 2295) reported the largest releases. This industry reported 9.9 million pounds of on-site releases and 236,000 pounds of off-site releases. Both amounts were the largest reported in this sector for these categories. Together, they represented 58.5% of the all releases reported in this sector.

Forms with multiple SIC codes reported the second-largest amounts of total on- and off-site releases, 1.5 million pounds, or 8.6% of the sector's total. Miscellaneous finishing plants (SIC code 2269) was third, with 1.5 million pounds, also 8.6%. However, taking into account two facility reporting errors in SIC code 2269 would reduce this amount to 1.1 million pounds. One facility submitted an incorrect amount for releases of methanol and another facility that should have reported in SIC code 2869 not SIC code 2269 (further described below).

Other on-site waste management reported in the textile mills sector totaled 42.0 million pounds in 1996. Miscellaneous finishing plants (SIC code 2269) reported nearly half (48.4%) of this amount, 20.3 million pounds. However, two forms indicating SIC code 2269 have been identified as containing reporting errors. These two forms accounted for 15.1 million pounds of the other on-site waste management reported in SIC code 2269. One of these forms was submitted by a facility that correctly stopped reporting non-aerosol forms of sulfuric acid in 1995, because EPA had modified the reporting definition for that chemical to require reporting of aerosol forms only. However, this facility erroneously submitted a form for non-aerosol forms of sulfuric acid for 1996, for

10.7 million pounds that it treated on-site. Secondly, an inorganic chemical manufacturing facility, which files in SIC code 2869, inadvertently submitted one form for xylenes in SIC code 2269. This form included 4.4 million pounds of on-site recycling of xylenes. After correcting for these errors, amounts of other on-site waste management for SIC code 2269 were 5.2 million pounds.

Manufacturing of coated fabrics (SIC code 2295) ranked second for other on-site waste management with 9.9 million pounds, or 23.5% of the sector's total, and finishing of manmade fabrics (SIC code 2262) was third with 5.5 million pounds, or 12.1%.

Coated fabrics (SIC code 2295) reported the largest transfers off-site for further waste management in this sector, 2.4 million pounds, 42.0% of the sector's 5.8 million-pound total. Miscellaneous finishing plants (SIC code 2269) was second with 927,000 pounds (16.1%). Forms reporting multiple codes ranked third with 755,000 pounds (13.1%).

Coated fabrics (SIC code 2295) also reported the largest production-related waste in 1996, 22.5 million pounds. The miscellaneous finishing plants industry (SIC code 2269) ranked second for total production-related waste, with 22.4 million pounds; the reporting errors described above reduce this industry's total to 7.1 million pounds, which was still the second-largest amount in this sector. The multiple-codes group was third, with 5.6 million pounds.

### Reporting Errors in 1996 Data for SIC Code 22

As mentioned above, some reports submitted to EPA contained errors. These included:

- reporting an incorrect amount for releases of methanol in SIC code 2269 (393,101 pounds instead of 42,493 pounds),
- reporting of 10.7 million pounds of sulfuric acid treated on-site in SIC code 2269 (the facility should not have submitted a form for this chemical), and



- reporting of 4.4 million pounds of xylenes recycled on-site in SIC code 2269 (this form should have been reported in SIC code 2869).

EPA is working with these facilities to correct their reporting errors. These facility errors are footnoted in the appropriate tables and figures and incorporated where there are comparisons in the text.

### Multiple SIC Codes in SIC Code 22

Table 4-2 further examines reporting on the forms submitted with multiple SIC codes. The most frequent combination, reported on 26 of the 120

forms with multiple SIC codes, was finishing broadwoven cotton fabrics (SIC code 2261) and finishing broadwoven manmade fabrics (SIC code 2262). This combination also reported the largest total on- and off-site releases (196,000 pounds) and the largest total production-related waste (1.2 million pounds) among multiple-codes forms in SIC code 22.

Twelve forms reported the combination of broadwoven cotton fabric mills (SIC code 2211) and finishing of broadwoven cotton fabrics (SIC code 2261), the second-largest number of multiple-codes forms in SIC code 20. This combination

**Table 4-2. Multiple SIC Codes, 1996: Textile Mill Products, SIC Code 22**

SIC Codes						Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
2211	2221					2	0	37,905	0	37,905	0	250	38,293	0
2211	2221	2259	2281	2282	2296	4	0	37,402	207	37,609	0	1,984	41,534	0
2211	2221	2261				4	1	15,604	0	15,604	0	55,579	71,183	0
2211	2221	2261	2262			1	0	16,370	0	16,370	0	0	16,370	0
2211	2221	2261	2262	2269	2281	4	0	162,227	0	162,227	0	6,768	168,996	0
2211	2221	2281				1	0	14,250	0	14,250	0	0	14,250	0
2211	2261					12	0	48,238	1,808	50,046	551,695	8,000	609,709	0
2211	2261	2262				2	0	59,791	0	59,791	0	250	59,923	0
2211	2261	2269				1	0	40,500	0	40,500	39,000	0	79,500	0
2211	2261	2281				1	0	13,100	0	13,100	69,000	0	69,000	0
2221	2257	2262	2295	2297		1	0	20	7,000	7,020	0	0	7,500	0
2221	2262					5	0	22,065	3,900	25,965	0	36,605	62,520	0
2221	2262	2269				2	0	30	0	30	1,988	1,988	5,964	0
2231	2262	2281				2	0	13,502	1	13,503	45,000	0	58,680	0
2231	2262	2295				7	1	170,355	1,500	171,855	886,600	0	1,057,200	0
2231	2283					2	0	46	0	46	55,539	1,659	57,244	0
2253	2254	2258				1	0	5,300	0	5,300	88,000	0	93,300	0
2253	2254	2269				1	0	3,300	0	3,300	0	0	3,300	0
2258	2261					1	0	1,521	0	1,521	0	13,693	15,214	0
2258	2262					3	0	23,768	3,577	27,345	17,455	0	44,800	0
2258	2269					2	0	2,185	0	2,185	0	29,019	31,204	0
2259	2262					2	0	159,000	0	159,000	275,580	0	275,580	0
2259	2262	2295	2299			3	0	9,549	9,886	19,435	0	104,910	122,728	0
2259	2269					2	0	11,620	0	11,620	313,800	1,170	326,600	0
2261	2262					26	1	196,377	1	196,378	767,559	204,845	1,171,649	350
2261	2262	2269				3	0	118,250	0	118,250	55,300	0	173,300	0
2261	2262	2295				6	0	1,832	0	1,832	86,343	254,627	342,802	0
2262	2269					7	0	27,600	0	27,600	140,000	11,350	179,250	118
2262	2269	2299				1	0	0	0	0	0	8,125	8,100	0
2262	2295					1	0	10,060	0	10,060	0	1,399	11,459	0
2269	2295	2297				3	0	32,920	13,522	46,442	0	750	49,743	0
2273	2297	2299				2	2	0	0	0	0	0	0	0
2281	2295					4	0	10,289	0	10,289	82,595	11,976	104,890	0
2282	2284	2298				1	0	191,000	0	191,000	0	0	191,000	0
Total for SIC Code 22						120	5	1,455,976	41,402	1,497,378	3,475,454	754,947	5,562,785	468

**Note:** **On-site Releases** from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** are transfers off-site to disposal from Section 6 of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 of Form R. **Total Production-related Waste** sums Section 8 of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents).



## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-3. TRI On-site and Off-site Releases, 1996: Textiles, SIC Code 22 (in Rank Order)**

SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases	
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds		Transfers Pounds	Total On- and Off-site Releases Pounds
2295	Coated Fabrics, Not Rubberized	9,908,147	270	0	0	0	0	9,908,417	236,305	10,144,722
	Multiple within SIC Code 22	1,147,765	149,787	0	0	0	158,424	1,455,976	41,402	1,497,378
2269	Finishing Plants, nec*	1,471,712	11,038	0	0	0	5	1,482,755	5	1,482,760
2284	Thread Mills	1,120,795	0	0	0	0	0	1,120,795	0	1,120,795
2221	Broadwoven Fabric Mills, Manmade	466,136	330	0	0	0	0	466,466	48,713	515,179
2273	Carpets & Rugs	372,361	40,860	0	0	0	0	413,221	5,813	419,034
2296	Tire Cord & Fabrics	334,078	360	0	0	0	10	334,448	59,102	393,550
2211	Broadwoven Fabric Mills, Cotton	287,100	55,904	0	0	0	250	343,254	250	343,504
2262	Finishing Plants, Manmade	289,244	200	0	0	0	0	289,444	42,763	332,207
2261	Finishing Plants, Cotton	201,294	17,771	0	0	0	0	219,065	0	219,065
2299	Textile Goods, nec*	173,796	800	0	0	0	0	174,596	14,066	188,662
2297	Nonwoven Fabrics	166,120	0	0	0	0	0	166,120	0	166,120
2231	Broadwoven Fabric Mills, Wool	72,514	71,307	0	0	0	1,801	145,622	6,322	151,944
2298	Cordage & Twine	106,331	0	0	0	0	0	106,331	0	106,331
2258	Lace & Warp Knit Fabric Mills	105,310	250	0	0	0	5	105,565	0	105,565
2282	Throwing & Winding Mills	42,197	0	0	0	0	0	42,197	0	42,197
2257	Weft Knit Fabric Mills	40,011	0	0	0	0	0	40,011	0	40,011
2253	Knit Outerwear Mills	6,470	0	0	0	0	13,125	19,595	12	19,607
	Invalid SIC Code within SIC Code 22	19,021	0	0	0	0	0	19,021	0	19,021
2281	Yarn Spinning Mills	12,300	0	0	0	0	0	12,300	0	12,300
2259	Knitting Mills, nec*	0	0	0	0	0	0	0	7,395	7,395
2251	Women's Hosiery, Except Socks	181	0	0	0	0	0	181	0	181
2252	Hosiery, nec*	2	0	0	0	0	0	2	0	2
2254	Knit Underwear Mills	0	0	0	0	0	0	0	0	0
	Total for SIC Code 22	16,342,885	348,877	0	0	0	173,620	16,865,382	462,148	17,327,530

**Note:** **On-site Releases** from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility reported incorrectly under SIC code 2269. The facility should have reported under SIC code 2869. The incorrectly reported amount was 51,735 pounds of total releases. Another facility incorrectly reported 393,101 pounds of total releases under SIC code 2269. The correct amount is 42,493 pounds. Accounting for these two facility errors, the total releases rank of SIC code 2269 changes from 3 to 4. **\*nec:** not elsewhere classified.

reported on- and off-site releases totaling 50,000 pounds and production-related waste totaling 610,000 pounds.

The group that combined throwing and winding mills (SIC coded 2282), thread mills (SIC code 2284), and cordage and twine (SIC code 2298) ranked second among multiple-codes forms for total on- and off-site releases with 191,000 pounds. The combination of broadwoven wool fabric mills (SIC code 2231), finishing broadwoven manmade fabrics (SIC code 2262), and coated fabrics (SIC code 2295) ranked second for total production-related waste, reporting 1.1 million pounds.

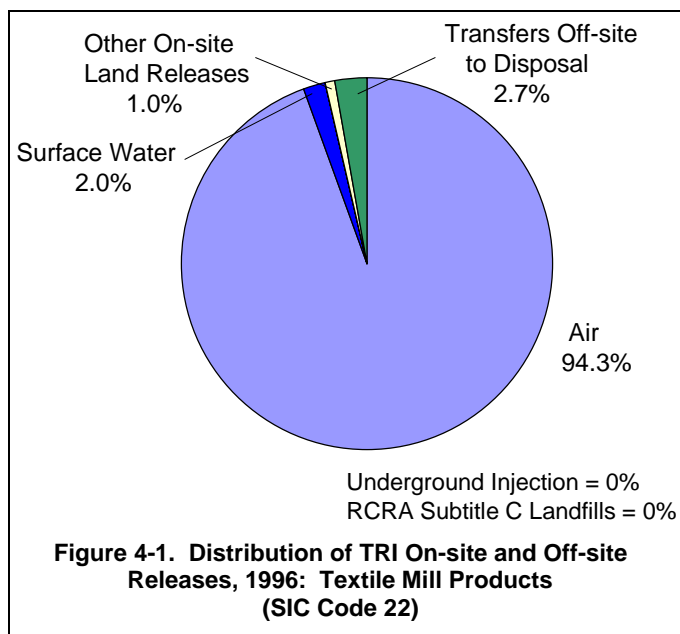
### On- and Off-site Releases

Air emissions reported in the textile mills sector totaled 16.3 million pounds in 1996, 94.3% of the sector's total releases of 17.3 million pounds, as

shown in Table 4-3. Surface water discharges were reported as 349,000 pounds. Although textile milling and finishing are water-intensive processes, releases to surface water was a smaller percentage (2.0%) of the sector's total releases than the average for all manufacturing industries (7.1%). Amounts reported for other on-site land releases (174,000 pounds) and off-site releases (transfers to disposal, 462,000 pounds) were also relatively small. Figure 4-1 makes clear the dominant role of air emissions among on- and off-site releases in this sector.

The industry reporting the largest total releases was coated fabrics (SIC code 2295), with 10.1 million pounds. This industry also had the largest air emissions (9.9 million pounds) and off-site releases (transfers to disposal, 236,000 pounds). The coated fabrics industry reported releases to air of 5.5 million pounds of methyl ethyl ketone and 2.8



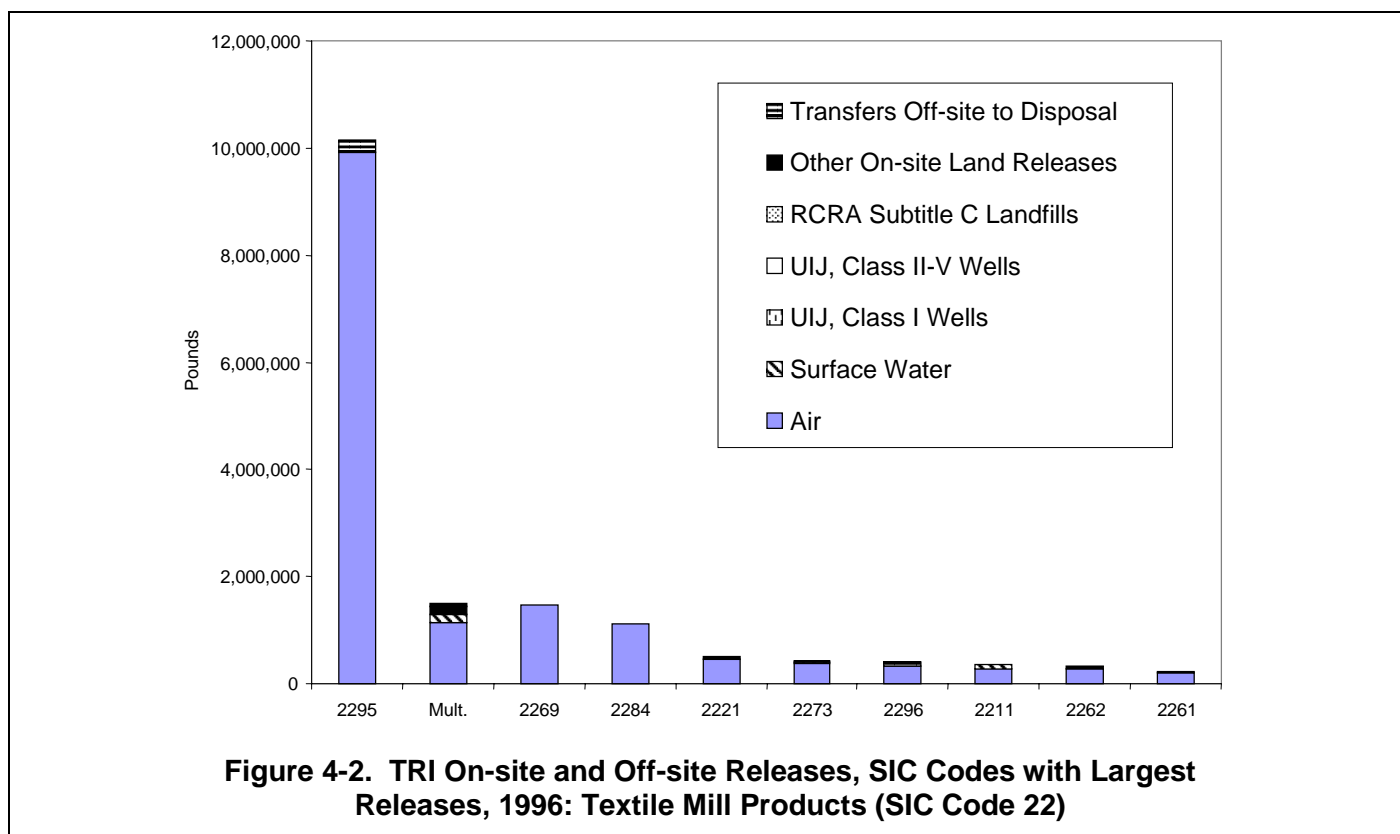


**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (transfers off-site to disposal) of Form R.

million pounds of toluene. This industry's transfers to disposal included 104,000 pounds of antimony compounds.

Forms reporting more than one SIC code in SIC code 22 reported 1.5 million pounds of total on- and off-site releases. These multiple-codes forms reported 1.1 million pounds of air emissions. This group had the largest surface water discharges (150,000 pounds) and also accounted for most of the sector's on-site land releases (158,000 pounds). Taking into account reporting errors previously described, the miscellaneous finishing plants industry (SIC code 2269) reported 1.08 million pounds of total releases, entirely as air emissions.

Figure 4-2 shows the distribution of on- and off-site releases for the industries (four-digit SIC code) with the sector's largest releases.

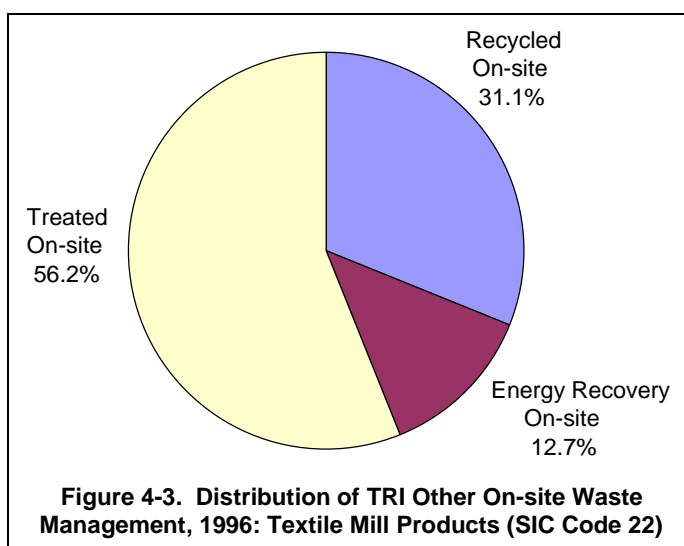


**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (transfers off-site to disposal). UIJ = underground injection. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility reported incorrectly under SIC code 2269. The facility should have reported under SIC code 2869. The incorrectly reported amount was 51,735 pounds of total releases. Another facility incorrectly reported 393,101 pounds of total releases under SIC code 2269. The correct amount is 42,493 pounds. Accounting for these two facility errors, the total releases rank of SIC code 2269 changes from 3 to 4.



## Other On-site Waste Management

Table 4-4 shows the other on-site waste management reported in the textile mills sector. More than half of the sector's total of 42.0 million pounds of other on-site waste management was reported as treated on-site (23.6 million pounds); this quantity includes 10.7 million pounds reported in error, as noted above. A total of 13.1 million pounds was reported in on-site recycling, including 4.4 million pounds reported in error, also as noted above. The sector also reported 5.3 million pounds of on-site energy recovery. Figure 4-3 illustrates this distribution of types of on-site waste management.



Note: Data from Section 8 of Form R.

**Table 4-4. TRI Other On-site Waste Management, 1996: Textile Mill Products, SIC Code 22 (in Rank Order)**

SIC Code	Industry	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
2269	Finishing Plants, nec*	6,282,304	981,867	13,062,801	20,326,972
2295	Coated Fabrics, Not Rubberized	1,982,438	3,221,289	4,691,918	9,895,645
2262	Finishing Plants, Manmade	3,849,529	1,114,500	123,240	5,087,269
	Multiple within SIC Code 22	303,000	3	3,172,451	3,475,454
2297	Nonwoven Fabrics	520,839	0	350,200	871,039
2273	Carpets & Rugs	6,000	0	645,381	651,381
2296	Tire Cord & Fabrics	0	0	447,621	447,621
2231	Broadwoven Fabric Mills, Wool	0	0	388,371	388,371
2299	Textile Goods, nec*	5,000	0	347,045	352,045
2261	Finishing Plants, Cotton	9,000	9,000	123,048	141,048
	Invalid SIC Code within SIC Code 22	0	0	126,484	126,484
2221	Broadwoven Fabric Mills, Manmade	82,273	0	20,346	102,619
2284	Thread Mills	0	0	77,022	77,022
2257	Weft Knit Fabric Mills	38,476	0	18,322	56,798
2253	Knit Outerwear Mills	0	0	23,000	23,000
2211	Broadwoven Fabric Mills, Cotton	0	0	10,037	10,037
2259	Knitting Mills, nec*	6,800	0	0	6,800
2258	Lace & Warp Knit Fabric Mills	0	0	495	495
2251	Women's Hosiery, Except Socks	0	0	0	0
2252	Hosiery, nec*	0	0	0	0
2254	Knit Underwear Mills	0	0	0	0
2281	Yarn Spinning Mills	0	0	0	0
2282	Throwing & Winding Mills	0	0	0	0
2298	Cordage & Twine	0	0	0	0
Total for SIC Code 22		13,085,659	5,326,659	23,627,782	42,040,100

**Note: Other On-site Waste Management** from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility reported incorrectly under SIC code 2269. The facility should have reported under SIC code 2869. The incorrectly reported amounts were as follows: 4,426,812 pounds of recycling on-site, 10,475 pounds of treatment on-site and 4,437,287 pounds of total other on-site waste management. Another facility incorrectly reported 10,679,852 pounds of treatment on-site and total on-site waste management in SIC code 2269 for 1996. The correct amount is 0 pounds. Accounting for these two facility errors, the rank of SIC code 2269 for total on-site waste management changes from 1 to 2.

\*nec: not elsewhere classified.



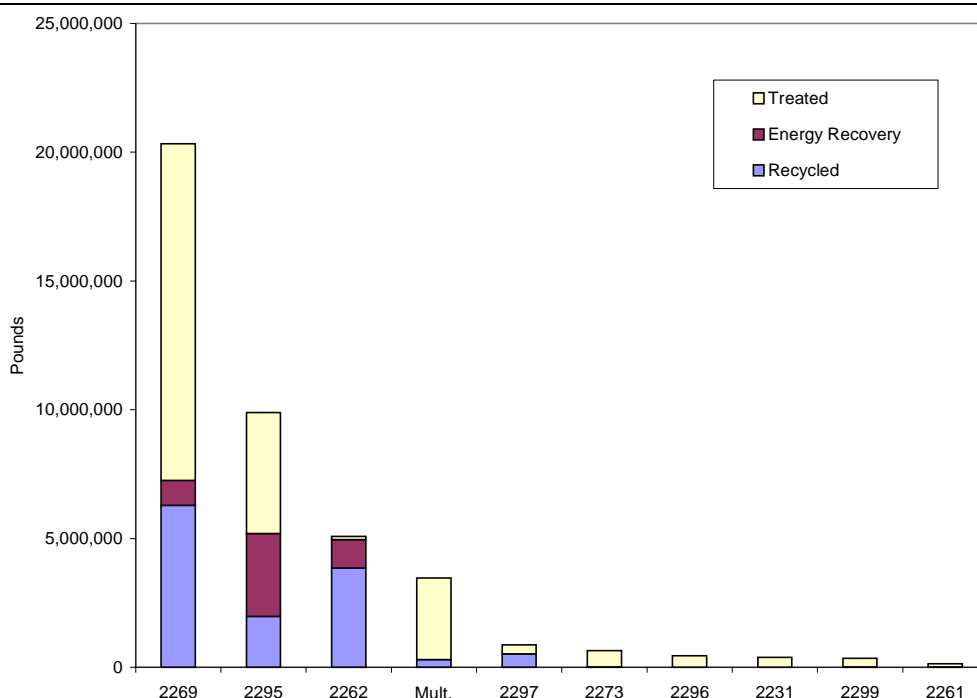
Miscellaneous finishing plants (SIC code 2269) reported the largest amounts of on-site recycling and on-site treatment in the textile mills sector, but these data included the reporting errors discussed earlier in this chapter. Taking these errors into account, finishing of manmade fabrics (SIC code 2262) ranked first for on-site recycling with 3.8 million pounds, and coated fabrics (SIC code 2295) ranked first for on-site treatment with 4.7 million pounds. Coated fabrics ranked second for on-site recycling with 2.0 million pounds, and the multiple-codes group ranked second for on-site treatment with 3.2 million pounds.

Coated fabrics (SIC code 2295) reported the largest amount of on-site energy recovery, 3.2 million pounds. Finishing of manmade fabrics (SIC code 2262) was second with 1.1 million pounds.

Figure 4-4 illustrates the distribution of on-site waste management reporting for the top industries in this sector.

### Transfers Off-site for Further Waste Management

Reporting of transfers off-site for further waste management in the textile mills sector was more diverse than was the case for on- and off-site releases and other on-site waste management. The total of such transfers was 5.8 million pounds. As shown in Table 4-5, the sector reported 2.3 million pounds of transfers to POTWs (39.8% of total transfers for further waste management), 1.9 million pounds to energy recovery (33.5%), and 1.0 million pounds to recycling (17.6%). The category with the smallest reported transfers was treatment, with 524,000 pounds (9.1% of the total transfers).



**Figure 4-4. TRI Other On-site Waste Management, SIC Codes with Largest Totals, 1996: Textile Mill Products (SIC Code 22)**

**Note: Other On-site Waste Management** from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC Code 22 are assigned to the "multiple" category. One facility reported incorrectly under SIC code 2269. The facility should have reported under SIC code 2869. The incorrectly reported amounts were as follows: 4,426,812 pounds of recycling on-site, 10,475 pounds of treatment on-site and 4,437,287 pounds of total other on-site waste management. Another facility incorrectly reported 10,679,852 pounds of treatment on-site and total on-site waste management in SIC code 2269 for 1996. The correct amount is 0 pounds. Accounting for these two facility errors, the rank of SIC code 2269 for total on-site waste management changes from 1 to 2.



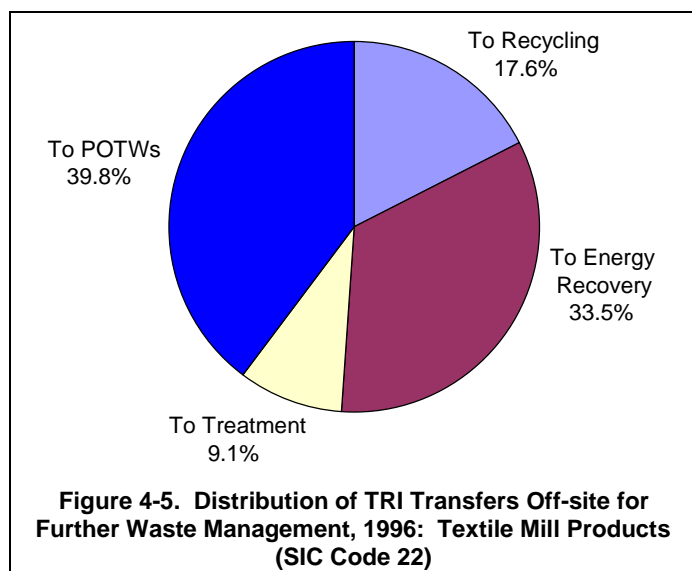
## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-5. TRI Transfers Off-site for Further Waste Management, 1996: Textile Mill Products, SIC Code 22 (in Rank Order)**

SIC Code	Industry	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Off-site Transfers for Further Waste Management Pounds
2295	Coated Fabrics, Not Rubberized	637,305	1,429,441	337,052	10,785	0	2,414,583
2269	Finishing Plants, nec*	331,005	397,046	94,078	105,059	0	927,188
	Multiple within SIC Code 22	0	2,649	13,757	738,541	0	754,947
2261	Finishing Plants, Cotton	0	0	0	424,132	0	424,132
2273	Carpets & Rugs	336	0	842	264,074	0	265,252
2221	Broadwoven Fabric Mills, Manmade	43,230	16,400	30	109,260	0	168,920
2284	Thread Mills	2,000	63,262	3,200	92,102	0	160,564
2211	Broadwoven Fabric Mills, Cotton	0	0	0	152,400	0	152,400
2252	Hosiery, nec*	0	0	0	108,891	0	108,891
2299	Textile Goods, nec*	0	7,875	0	86,444	0	94,319
2262	Finishing Plants, Manmade	0	0	4,455	75,149	0	79,604
2257	Weft Knit Fabric Mills	0	0	50,288	22,005	0	72,293
2231	Broadwoven Fabric Mills, Wool	0	0	5,172	20,635	0	25,807
2254	Knit Underwear Mills	0	0	0	24,153	0	24,153
2296	Tire Cord & Fabrics	0	0	12,491	7,205	0	19,696
2282	Throwing & Winding Mills	0	6,327	0	12,817	0	19,144
2253	Knit Outerwear Mills	0	0	0	17,738	0	17,738
2258	Lace & Warp Knit Fabric Mills	0	0	0	14,000	0	14,000
2297	Nonwoven Fabrics	0	0	2,574	2,137	0	4,711
2298	Cordage & Twine	0	3,069	0	0	0	3,069
2259	Knitting Mills, nec*	0	0	0	38	0	38
2251	Women's Hosiery, Except Socks	0	0	0	0	0	0
2281	Yarn Spinning Mills	0	0	0	0	0	0
	Invalid SIC Code within SIC Code 22	0	0	0	0	0	0
	Total for SIC Code 22	1,013,876	1,926,069	523,939	2,287,565	0	5,751,449

**Note:** Off-site Transfers for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category.

\*nec: not elsewhere classified.

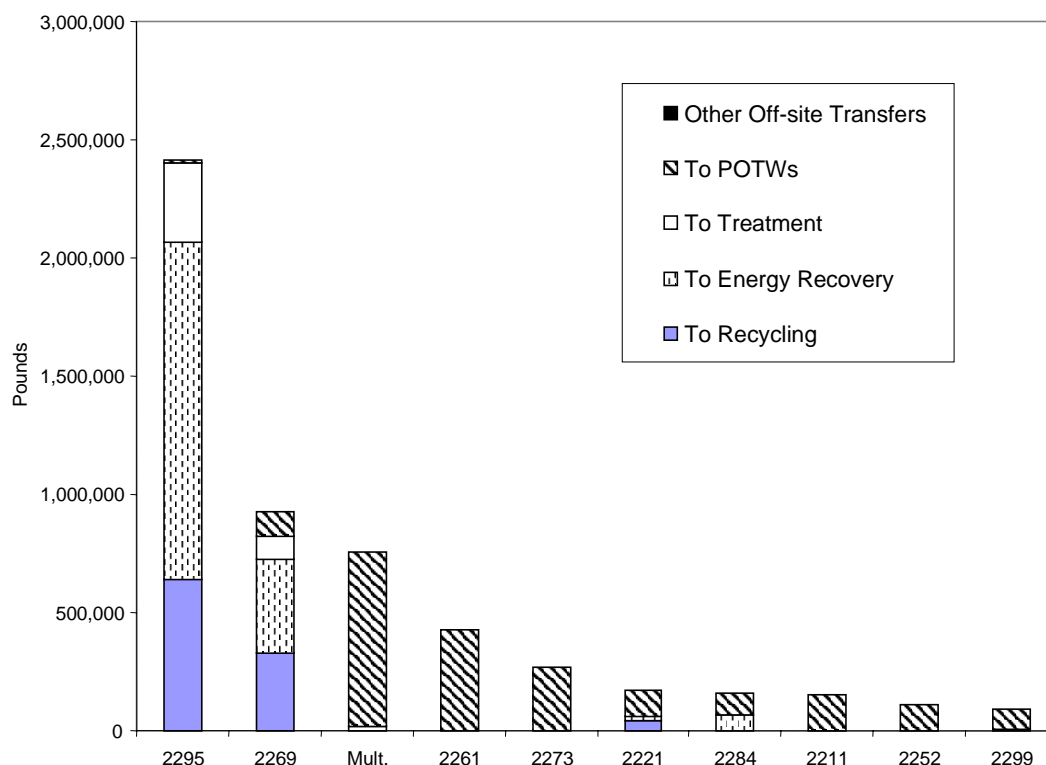


**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R.

Figure 4-5 shows the distribution of these types of transfers off-site.

The textile milling industry with the largest transfers off-site for further waste management was coated fabrics (SIC code 2295), with a total of 2.4 million pounds. Miscellaneous finishing plants (SIC code 2269) was second, with 927,000 pounds. Both industries reported amounts in all four types of transfers off-site for further waste management, and for both industries, transfers to energy recovery was the largest type (1.4 million pounds for the coated fabrics industry and 397,000 pounds for the miscellaneous finishing plants).

Forms with multiple SIC codes within SIC code 22 ranked third for transfers off-site for further waste management, with 755,000 pounds, which was principally comprised of transfers to POTWs.



**Figure 4-6. TRI Transfers Off-site for Further Waste Management, SIC Codes with Largest Totals, 1996: Textile Mill Products (SIC Code 22)**

**Note:** Off-site Transfers for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other off-site transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the “multiple” category.

Figure 4-6 illustrates the distribution of off-site transfers for further waste management for the top industries in this sector.

## 1996 TRI Data by State for Textile Mill Products

Table 4-6 presents summary data for the textile mills sector by state. Historically centered in New England, a substantial segment of the sector has migrated to the southeast. More than 10% of the forms in this sector were submitted in each of three states: North Carolina (117 forms, 17.8% of the total), South Carolina (86 forms, 13.1%), and Georgia (78 forms, 11.9%).

Other states, however, ranked first for the largest total releases and largest amounts of total production-related waste in this sector.

The largest total on- and off-site releases were reported in Mississippi, with 4.0 million pounds, or 23.0% of the sector’s total releases. Mississippi also had the largest on-site releases, 3.9 million pounds, or 23.3% of the sector’s total on-site releases. North Carolina was second in both categories, with 2.8 million pounds of total releases, including 2.7 million pounds of on-site releases. These amounts were 15.9% of the sector’s total in these categories. Tennessee was third with 1.7 million pounds in both total releases and on-site releases, approximately 10% of these categories.



## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-6. Summary of TRI Information by State, 1996: Textile Mill Products, SIC Code 22**

State	Total Facilities Number	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
Alabama	13	32	7	583,708	45,345	629,053	483,766	102,274	1,202,129	350
Arkansas	3	9	0	79,202	44,935	124,137	165,113	8,610	269,036	0
California	7	15	0	143,701	0	143,701	1,179,406	451,625	1,775,255	200
Connecticut	8	19	0	390,693	0	390,693	1,966,576	82,139	2,439,153	0
Florida	1	1	0	1,262	0	1,262	240,000	0	241,257	0
Georgia	47	78	10	780,146	9,228	789,374	911,711	424,705	2,024,771	0
Illinois	3	5	1	99,700	0	99,700	0	50,405	150,300	0
Indiana	1	2	0	31,481	0	31,481	0	0	31,481	0
Kentucky	2	3	0	28,788	0	28,788	520,839	525	550,557	0
Maine	2	3	0	10,904	0	10,904	330	20,130	31,164	0
Maryland	3	6	0	145,544	0	145,544	49,503	194,941	378,563	0
Massachusetts	19	50	3	677,259	25,637	702,896	4,041,110	564,822	5,281,702	0
Michigan	2	2	0	43,109	0	43,109	0	8,101	50,947	0
Minnesota	1	4	0	124,940	0	124,940	645,482	91,354	861,776	0
Mississippi	3	11	0	3,930,020	51,450	3,981,470	2,111,300	146,870	6,217,668	0
Missouri	1	1	0	11,641	0	11,641	12,207	0	12,207	0
New Hampshire	2	2	0	12,858	0	12,858	42,750	255	57,899	0
New Jersey	16	32	0	131,942	0	131,942	554,119	173,690	795,535	0
New York	5	8	1	55,320	0	55,320	50,625	3,069	93,191	0
North Carolina	68	117	4	2,677,248	80,268	2,757,516	3,414,418	1,297,922	7,516,495	118
Ohio	10	31	3	1,380,418	43,070	1,423,488	1,707,996	343,122	3,462,172	0
Oklahoma	1	1	1	0	0	0	0	0	0	0
Oregon	1	2	0	35,750	0	35,750	0	0	36,000	0
Pennsylvania	7	10	3	92,731	9,604	102,335	3,612,134	42,081	3,756,335	0
Puerto Rico	1	6	0	6,060	0	6,060	23,000	101	29,061	0
Rhode Island	9	31	0	679,633	1,700	681,333	1,691,595	114,720	2,155,113	0
South Carolina	38	86	0	1,347,117	38,083	1,385,200	5,732,725	807,752	7,934,733	0
Tennessee	6	18	1	1,717,401	21,268	1,738,669	10,959,439	268,707	12,966,969	0
Texas	5	6	0	16,605	0	16,605	277,225	42,661	332,759	0
Vermont	1	1	0	3,320	0	3,320	19,000	5	22,300	0
Virginia	17	52	1	755,549	78,691	834,240	1,472,321	121,297	2,507,278	490
Washington	2	5	0	33,131	0	33,131	18,130	377,977	429,238	0
Wisconsin	2	8	0	838,201	12,869	851,070	137,280	11,589	996,023	0
Total for SIC Code 22	307	657	35	16,865,382	462,148	17,327,530	42,040,100	5,751,449	64,609,067	1,158

**Note:** **On-site Releases** from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). One facility in South Carolina reported incorrectly in SIC code 22 for 1996. The facility should have reported in SIC code 28. The incorrectly reported amounts were as follows: 51,735 pounds of total releases, 4,437,287 pounds of other on-site waste management, 61,342 pounds of transfers off-site for further waste management and 4,552,414 pounds of total production-related waste. The rank of South Carolina for total other on-site waste management changes from 2 to 10 and for total production-related waste from 2 to 7. Another facility, in Rhode Island, incorrectly reported 393,101 pounds of total releases. The correct amount is 42,493 pounds. One facility in Ohio incorrectly reported 10,679,852 pounds of other on-site waste management and total production-related waste. The rank of Ohio for total other on-site waste management changes from 1 to 14 and for total production-related waste changes from 1 to 9.

The largest off-site releases (transfers to disposal) were reported in North Carolina (80,000 pounds), Virginia (79,000 pounds), and Mississippi (51,000 pounds).

Excluding reporting errors, Massachusetts ranked first for on-site waste management, with a total of 4.0 million pounds. Pennsylvania followed with 3.6 million pounds and North Carolina with 3.4 million pounds. Ranking first for total production-related

waste was North Carolina, with 7.5 million pounds. Other states where production-related waste was reported in large quantities in this sector were Mississippi with 6.2 million pounds and Massachusetts with 5.3 million pounds.

For transfers off-site for further waste management, North Carolina reported the largest amount, 1.3 million pounds. South Carolina reported 746,000 pounds (excluding a reporting error) and



Massachusetts 565,000 pounds, placing them second and third in this category.

Map 4-1 illustrates the geographic distribution of total on- and off-site releases in the textile mills sector.

## 1996 TRI Data by Chemical for Textile Mill Products

The 15 chemicals with the largest on- and off-site releases in the textile mills sector appear in Table 4-7. Releases of these chemicals totaled 15.7 million pounds, or 90.7% of all releases reported in textile milling. The majority of this reporting was for air emissions, which totaled 15.0 million pounds. Air emissions accounted for 85% or more of the releases of 13 of the 15 chemicals. Surface water discharges were 317,000 pounds, and other on-site land releases were 158,000 pounds. Off-site releases (transfers to disposal) of 203,000 pounds were reported for these chemicals.

The chemical with the largest total releases was methyl ethyl ketone (MEK), with 5.7 million pounds. Ranking second and third were toluene with 3.7 million pounds and methanol with 2.4 million pounds. Air emissions accounted for nearly 100% of the releases of all three chemicals. All three are widely used in fabric coating and are also used in finishing operations. One facility in the coated fabrics industry reported air emissions of 2.8 million pounds of MEK, used in printing processes. This facility is changing to water-based inks and phasing out this use of MEK (see “Facilities with Largest Increases and Decreases in Releases, 1988-1996,” later in this chapter.)

The two chemicals with large releases other than air emissions were nitrate compounds and antimony compounds. For nitrate compounds, which had total releases of 444,000 pounds, discharges to surface

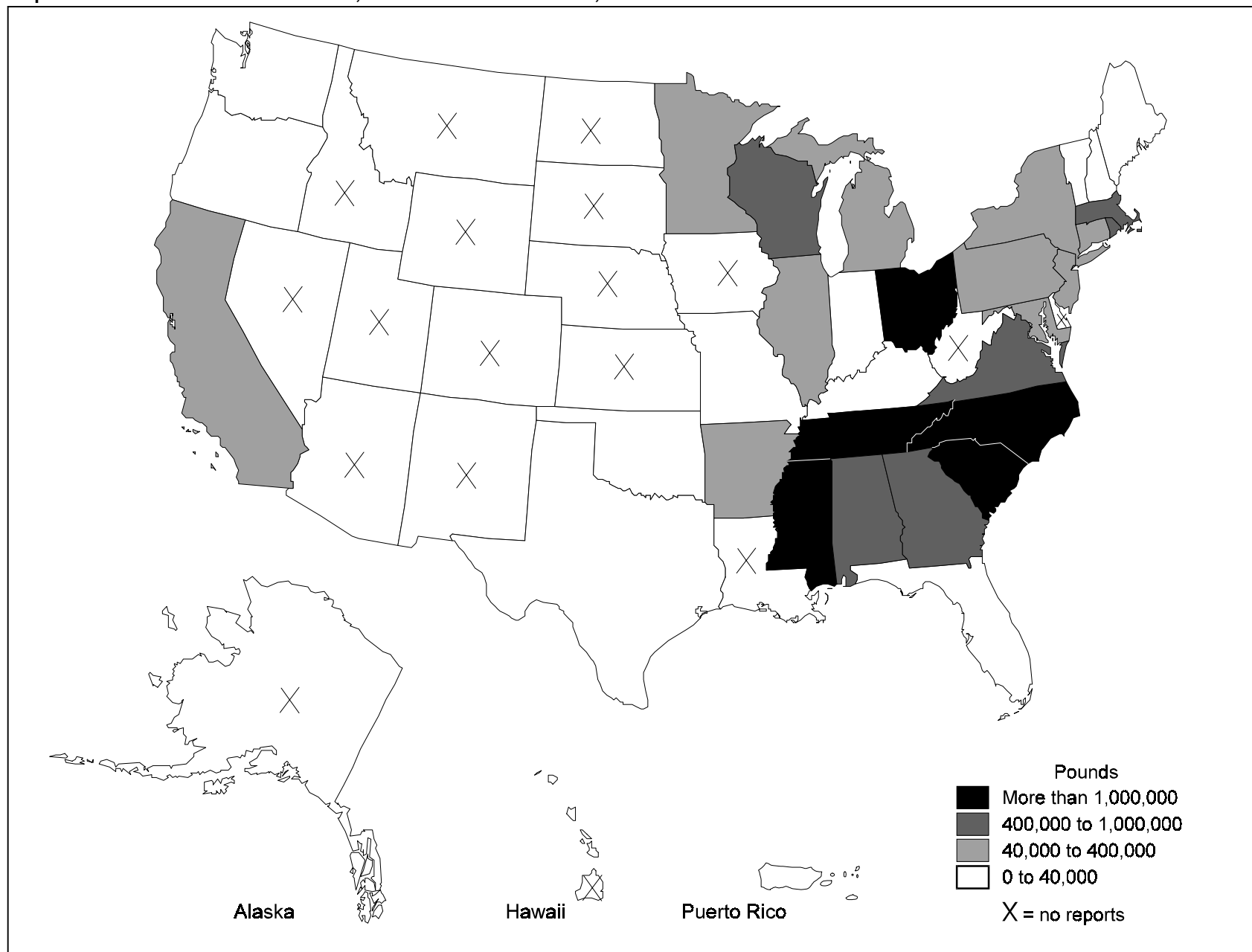
water were 284,000 pounds and other on-site land releases were 158,000 pounds. Forms with multiple SIC codes in SIC code 22 reported the largest amounts of nitrate compounds in both categories: 117,000 pounds of the surface water discharges and all of the other on-site land releases. For antimony compounds, with 174,000 pounds of total releases, the primary type of release was off-site (transfers to disposal). Antimony trioxide is used in the textile industry as a flame retardant in fabrics. Antimony compounds may also be used as solvents. The coated fabrics industry (SIC code 2295) reported 104,000 pounds of the off-site releases of antimony compounds.

## OSHA Carcinogens

On- and off-site releases of chemicals designated as OSHA carcinogens totaled 1.0 million pounds in the textile mills sector in 1996. This was 5.9% of the sector’s total on- and off-site releases, a smaller percentage than in many sectors that report to TRI. Table 4-8 shows the releases of these chemicals by four-digit industry in this sector. (OSHA carcinogens and the bases for their designation appear in Box 1-9 in Chapter 1.) Thread mills (SIC code 2284) reported the largest releases of OSHA carcinogens in this sector, 273,000 pounds. Miscellaneous finishing plants (SIC code 2269) reported 164,000 pounds, ranking second, and coated fabrics (SIC code 2295), reported 119,000 pounds, ranking third.

Two of the top 15 chemicals for total releases in this sector were OSHA carcinogens: dichloromethane and trichloroethylene. Total releases of these two chemicals were 469,000 pounds and 157,000 pounds, respectively (see Table 4-7). OSHA carcinogens with the next-largest amounts released on- and off-site were formaldehyde with 107,000 pounds, N,N-dimethylformamide with 98,000 pounds, and styrene with 87,000 pounds.

**Note: On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R.







**Table 4-7. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1996: Textile Mill Products, SIC Code 22 (in Rank Order)**

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
78-93-3	Methyl ethyl ketone	5,672,423	250	0	0	0	0	5,672,673	9,400	5,682,073
108-88-3	Toluene	3,648,784	5	0	0	0	0	3,648,789	2,200	3,650,989
67-56-1	Methanol	2,387,251	1,650	0	0	0	0	2,388,901	665	2,389,566
7664-41-7	Ammonia	765,182	6,894	0	0	0	0	772,076	4,953	777,029
108-10-1	Methyl isobutyl ketone	510,132	0	0	0	0	0	510,132	250	510,382
1330-20-7	Xylene (mixed isomers)	505,752	1,669	0	0	0	0	507,421	0	507,421
75-09-2	Dichloromethane	468,680	0	0	0	0	0	468,680	0	468,680
--	Nitrate compounds	500	284,407	0	0	0	158,000	442,907	1,401	444,308
872-50-4	N-Methyl-2-pyrrolidone	290,774	26	0	0	0	0	290,800	1,099	291,899
91-20-3	Naphthalene	215,666	5,100	0	0	0	0	220,766	0	220,766
--	Antimony compounds	1,188	1,157	0	0	0	0	2,345	171,987	174,332
--	Glycol ethers	161,027	4,891	0	0	0	0	165,918	250	166,168
79-01-6	Trichloroethylene	156,528	0	0	0	0	0	156,528	0	156,528
107-21-1	Ethylene glycol	130,119	11,150	0	0	0	0	141,269	10,800	152,069
110-54-3	n-Hexane	123,765	0	0	0	0	0	123,765	0	123,765
	Subtotal	15,037,771	317,199	0	0	0	158,000	15,512,970	203,005	15,715,975
	Total for SIC Code 22	16,342,885	348,877	0	0	0	173,620	16,865,382	462,148	17,327,530

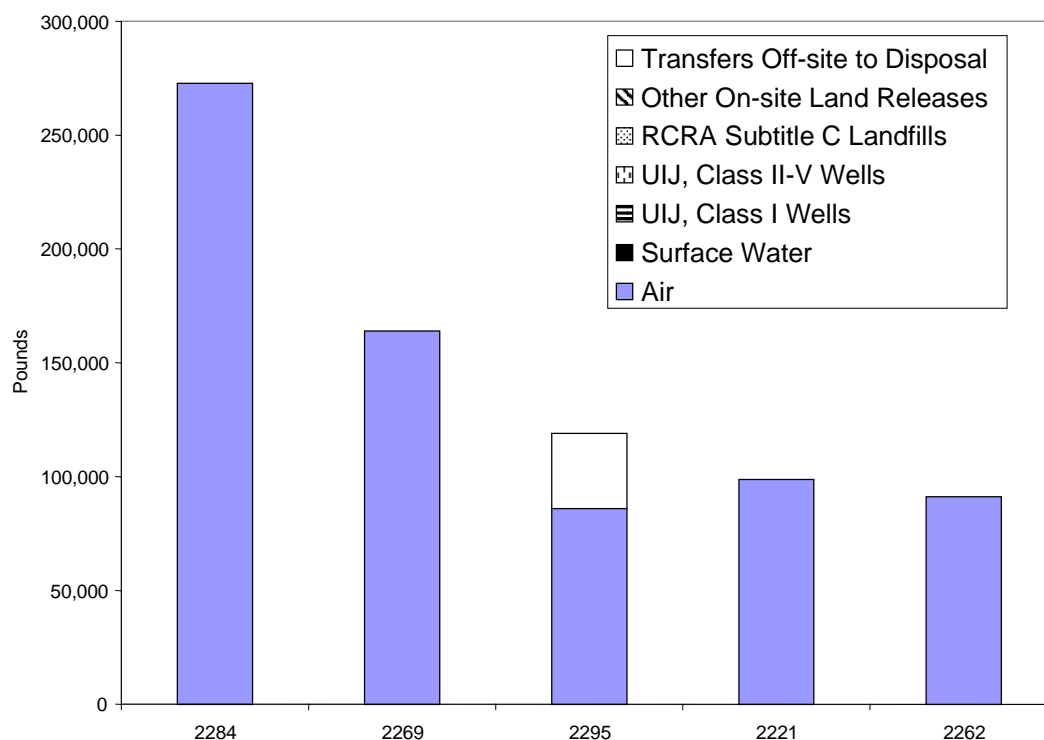
**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (off-site transfers to disposal) of Form R. One facility reported incorrectly in SIC code 22 for 1996. The facility should have reported in SIC code 28. The incorrectly reported amount was 51,735 pounds of total releases of xylene (mixed isomers). The total releases rank of xylene (mixed isomers) changes from 6 to 7.

**Table 4-8. TRI On-site and Off-site Releases of OSHA Carcinogens by 4-digit SIC Code, 1996: Textile Mill Products, SIC Code 22 (in Rank Order)**

SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
2284	Thread Mills	272,595	0	0	0	0	0	272,595	0	272,595
2269	Finishing Plants, nec*	163,878	0	0	0	0	0	163,878	0	163,878
2295	Coated Fabrics, Not Rubberized	86,344	0	0	0	0	0	86,344	32,558	118,902
2221	Broadwoven Fabric Mills, Manmade	98,734	0	0	0	0	0	98,734	0	98,734
2262	Finishing Plants, Manmade	91,142	0	0	0	0	0	91,142	0	91,142
	Multiple within SIC Code 22	80,710	100	0	0	0	0	80,810	340	81,150
2273	Carpets & Rugs	39,388	660	0	0	0	0	40,048	390	40,438
2257	Weft Knit Fabric Mills	40,000	0	0	0	0	0	40,000	0	40,000
2297	Nonwoven Fabrics	21,188	0	0	0	0	0	21,188	0	21,188
2261	Finishing Plants, Cotton	20,702	0	0	0	0	0	20,702	0	20,702
2299	Textile Goods, nec*	19,800	0	0	0	0	0	19,800	0	19,800
2296	Tire Cord & Fabrics	13,995	0	0	0	0	0	13,995	1,849	15,844
2298	Cordage & Twine	15,132	0	0	0	0	0	15,132	0	15,132
2231	Broadwoven Fabric Mills, Wool	11,754	187	0	0	0	0	11,941	0	11,941
2282	Throwing & Winding Mills	10,500	0	0	0	0	0	10,500	0	10,500
2253	Knit Outerwear Mills	171	0	0	0	0	0	171	0	171
	Subtotal	986,033	947	0	0	0	0	986,980	35,137	1,022,117
	Total for SIC Code 22	16,342,885	348,877	0	0	0	173,620	16,865,382	462,148	17,327,530

**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (off-site transfers to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category.

\*nec: not elsewhere classified.



**Figure 4-7. TRI On-site and Off-site Releases of OSHA Carcinogens, SIC Codes with Largest Totals, 1996: Textile Mill Products (SIC Code 22)**

**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (off-site transfers to disposal) for Form R. UIJ = underground injection.

Figure 4-7 illustrates the on- and off-site releases of the four-digit SIC codes with the largest OSHA carcinogen releases.

## 1996 TRI Chemicals in Waste for Textile Mill Products

The textile mills sector reported total production-related waste in 1996 of 64.6 million pounds, as shown in Table 4-9. The waste management reported in the largest amount was on-site treatment, with 23.6 million pounds. As noted earlier in this chapter, this included 10.7 million pounds, identified as a reporting error. The sector also reported 13.1 million pounds of on-site recycling, including a 4.4 million-pound reporting error.

Quantities reported as released on- and off-site were 16.8 million pounds. Other waste management types each accounted for 5 million pounds or less of the total. Figure 4-8 illustrates the distribution of waste management types in this sector.

Coated fabrics (SIC code 2295) reported the largest quantities of total production-related waste (22.5 million pounds) and the largest quantities of on- and off-site releases (10.1 million pounds). This industry's reporting accounted for 60.0% of the sector's quantities released.

Distribution of production-related waste for the top industries in the sector appears in Figure 4-9.

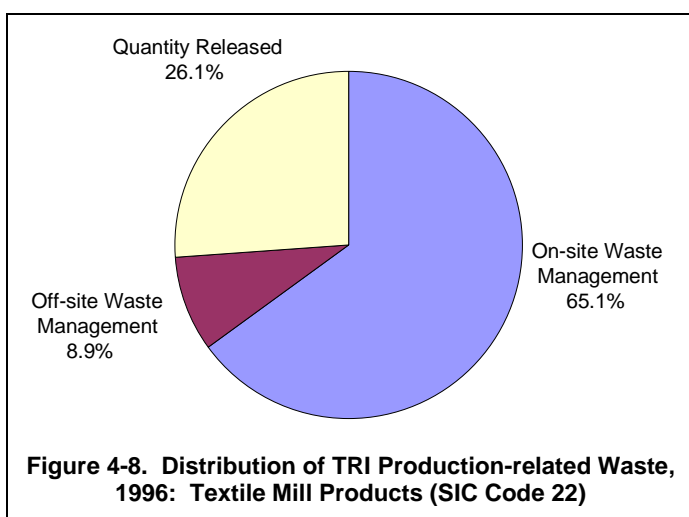


**Table 4-9. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1996: Textile Mill Products, SIC Code 22 (in Rank Order)**

SIC Code	Industry	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Recycled Off-site Pounds	Energy Recovery Off-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
2295	Coated Fabrics, Not Rubberized	1,982,438	3,221,289	4,691,918	632,699	1,469,329	348,260	10,107,815	22,453,748	0
2269	Finishing Plants, nec*	6,282,304	981,867	13,062,801	331,000	399,096	192,882	1,115,805	22,365,755	0
	Multiple within SIC Code 22	303,000	3	3,172,451	0	2,649	750,527	1,334,155	5,562,785	468
2262	Finishing Plants, Manmade	3,849,529	1,114,500	123,240	0	0	85,561	326,885	5,499,715	0
2273	Carpets & Rugs	6,000	0	645,381	0	0	263,741	473,428	1,388,550	0
2284	Thread Mills	0	0	77,022	0	63,254	83,992	1,085,060	1,309,328	0
2297	Nonwoven Fabrics	520,839	0	350,200	0	0	4,846	167,625	1,043,510	0
2221	Broadwoven Fabric Mills, Manmade	82,273	0	20,346	110,491	16,400	109,033	515,093	853,636	0
2296	Tire Cord & Fabrics	0	0	447,621	6,027	0	7,261	369,017	829,926	490
2261	Finishing Plants, Cotton	9,000	9,000	123,048	0	0	457,601	220,346	818,995	0
2299	Textile Goods, nec*	5,000	0	347,045	0	7,875	85,796	189,894	635,610	0
2231	Broadwoven Fabric Mills, Wool	0	0	388,371	0	0	25,525	138,223	552,119	0
2211	Broadwoven Fabric Mills, Cotton	0	0	10,037	0	0	152,645	343,516	506,198	0
	Invalid SIC Code within SIC Code 22	0	0	126,484	0	0	0	18,539	145,023	200
2258	Lace & Warp Knit Fabric Mills	0	0	495	0	0	14,000	104,802	119,297	0
2257	Weft Knit Fabric Mills	38,476	0	18,322	0	0	22,375	40,086	119,259	0
2298	Cordage & Twine	0	0	0	0	3,069	0	106,331	109,400	0
2252	Hosiery, nec*	0	0	0	0	0	17,891	91,120	109,011	0
2282	Throwing & Winding Mills	0	0	0	0	6,237	12,677	54,874	73,788	0
2253	Knit Outerwear Mills	0	0	23,000	0	0	17,144	22,403	62,547	0
2254	Knit Underwear Mills	0	0	0	0	0	24,153	0	24,153	0
2259	Knitting Mills, nec*	6,800	0	0	0	0	0	7,433	14,233	0
2281	Yarn Spinning Mills	0	0	0	0	0	0	12,300	12,300	0
2251	Women's Hosiery, Except Socks	0	0	0	0	0	0	181	181	0
Total for SIC Code 22		13,085,659	5,326,659	23,627,782	1,080,217	1,967,909	2,675,910	16,844,931	64,609,067	1,158

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility reported incorrectly in SIC code 2269 for 1996. The facility should have reported in SIC code 2869. The incorrectly reported amounts were as follows: 4,426,812 pounds of recycling on-site and 4,552,414 pounds of total production-related waste. The rank for recycling on-site for SIC code 2269 changes from 1 to 4. Another facility incorrectly reported 10,679,852 pounds of treatment on-site and total production-related waste under SIC code 2269. The correct amount is 0 pounds. The rank for treatment on-site of SIC code 2269 changes from 1 to 3.

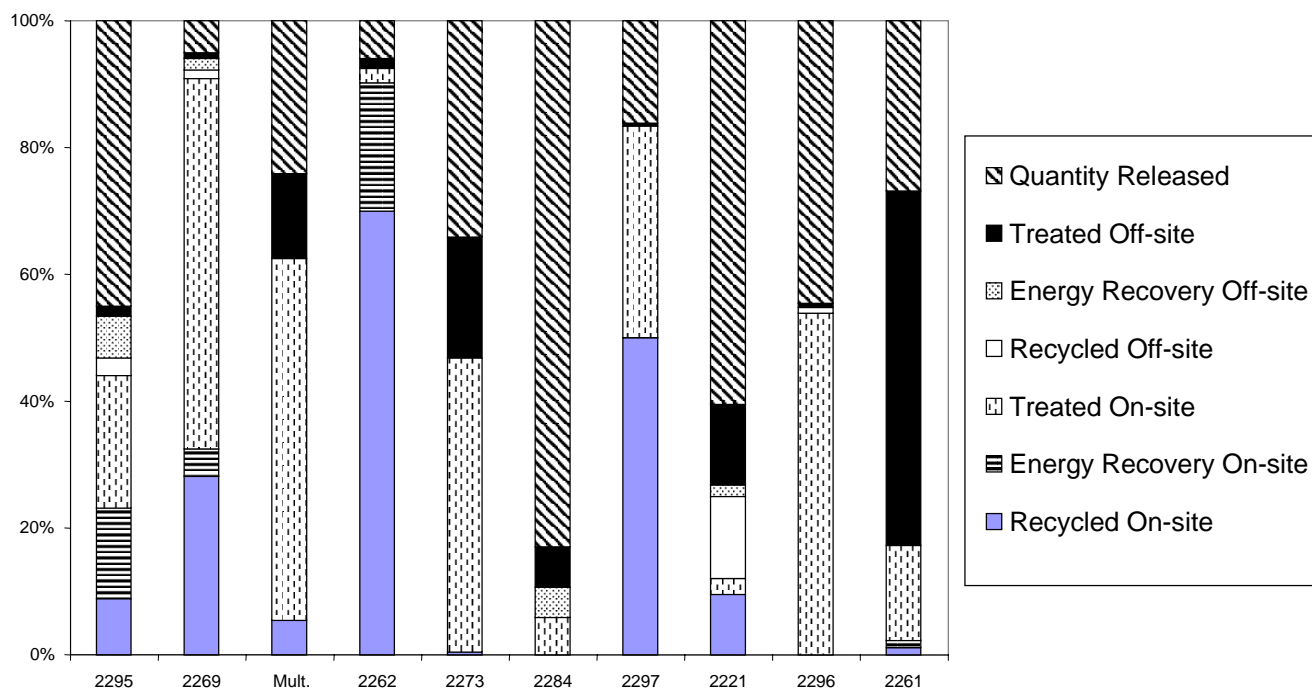
\*nec: not elsewhere classified.



**Note:** Data from Section 8 of Form R.

## Projected Quantities of TRI Chemicals in Waste

As shown in Table 4-10, waste management quantities in the textile mills sector were projected to decrease 7.3% by 1998. (As explained in Chapter 1, facilities not only report current data but project waste management quantities for the next two years in their TRI submissions.) Forms in this sector reported total production-related waste of 64.6 million pounds in 1996 and projected total production-related waste of 59.9 million pounds in 1998. These projections, however, include the two forms that represent large reporting errors in this sector for on-site recycling and on-site treatment.



**Figure 4-9. Distribution of Production-related Waste, SIC Codes with Largest Totals, 1996: Textile Mill Products (SIC Code 22)**

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC Code within SIC code 22 are assigned to the “multiple” category.

Excluding the data from those two forms, total production-related waste for the textile mills sector would decrease 12.7% from 49.4 million pounds in 1996 to a projected 43.1 million pounds in 1998. The great majority of this projected 6.3 million-pound reduction was expected in quantities released on- and off-site. The projection for this category was a decrease of 5.8 million pounds.

Figure 4-10 illustrates the projected percentage changes in waste management in this sector.

When data from the two reporting errors are excluded, the quantities released for this sector are projected to decrease from one-third (34.0%) of the 1996 total production-related waste to one-fourth (25.4%) of the total in 1998. This indicates that improvement is expected in the textile mills sector’s management of TRI chemicals in waste, as measured by the waste management hierarchy, explained in Chapter 1. In the terms of the

hierarchy, release or disposal is the least environmentally desirable option.

## Source Reduction Activity

Of the 657 forms submitted by the textile mills sector, 144 reported undertaking one or more source reduction activities in 1996. Reporting of source reduction activities in this sector appears in Table 4-11.

In the coated fabrics industry (SIC code 2295), 58 forms reported source reduction activity, more than one-third (36.7%) of the forms submitted in this industry. In the miscellaneous finishing plants industry (SIC code 2669), 19 forms indicated source reduction activity, which was 28.4% of the industry’s forms. These were the industries with the largest number of such forms.



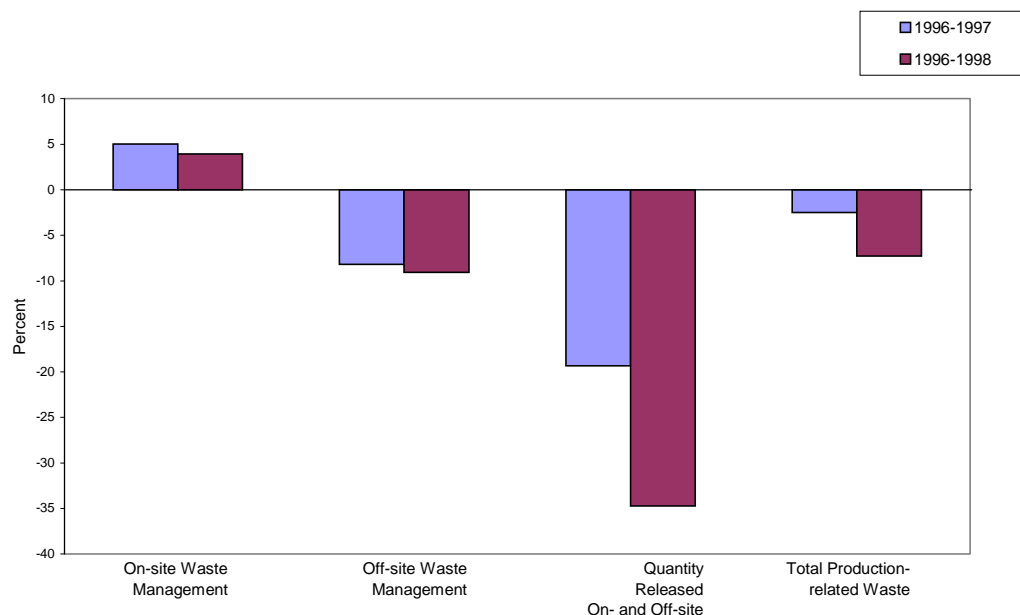
**Table 4-10. Current Year and Projected Quantities of TRI Chemicals in Waste, 1996-1998: Textile Mill Products, SIC Code 22**

Waste Management Activity	Current Year 1996		Projected 1997		Projected 1998	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
<u>On-site Waste Management</u>						
Recycled On-site	13,085,659	20.3	13,388,910	21.3	12,637,308	21.1
Energy Recovery On-site	5,326,659	8.2	5,483,169	8.7	5,612,342	9.4
Treated On-site	23,627,782	36.6	25,282,626	40.1	25,452,438	42.5
<u>Off-site Waste Management</u>						
Recycled Off-site	1,080,217	1.7	1,117,078	1.8	1,139,546	1.9
Energy Recovery Off-site	1,967,909	3.0	1,670,560	2.7	1,593,535	2.7
Treated Off-site	2,675,910	4.1	2,467,935	3.9	2,471,827	4.1
Quantity Released On- and Off-site	16,844,931	26.1	13,590,168	21.6	10,996,882	18.4
Total Production-related Waste for SIC Code 22	64,609,067	100.0	63,000,446	100.0	59,903,878	100.0
Waste Management Activity	Projected Change		Projected Change		Projected Change	
	1996-1997		1997-1998		1996-1998	
	Percent		Percent		Percent	
<u>On-site Waste Management</u>						
Recycled On-site		2.3		-5.6		-3.4
Energy Recovery On-site		2.9		2.4		5.4
Treated On-site		7.0		0.7		7.7
<u>Off-site Waste Management</u>						
Recycled Off-site		3.4		2.0		5.5
Energy Recovery Off-site		-15.1		-4.6		-19.0
Treated Off-site		-7.8		0.2		-7.6
Quantity Released On- and Off-site		-19.3		-19.1		-34.7
Total Production-related Waste for SIC Code 22		-2.5		-4.9		-7.3

**Note:** Current year and projected year amounts are all taken from Section 8 of Form R for 1996. One facility reported incorrectly in SIC code 22 for 1996. The facility should have reported in SIC code 28. The incorrectly reported amounts were as follows: 4,426,812 pounds of recycling on-site, 63,392 pounds of energy recovery off-site, 10,475 pounds of treatment on-site and 51,735 pounds of quantity released on- and off-site for 1996 and projections of 4,500,000 pounds of recycling on-site, 60,000 pounds of energy recovery off-site, 10,000 pounds of treatment on-site and 50,000 pounds of quantity released on- and off-site for 1997 and 1998. Another facility incorrectly reported 10,679,852 pounds of treatment on-site for 1996 and projected 12,016,010 pounds for 1997 and 12,200,000 pounds for 1998. The correct amounts are 0 pounds. The percentage change from 1996 to 1997 in recycling on-site changes from 2.3% to 2.7%, in treatment on-site changes from 7.0% to 2.5%, and in total production-related waste changes from -2.5% to -6.1%. The percentage change from 1997 to 1998 in recycling on-site changes from -5.6% to -8.5%, in treatment on-site changes from 0.7% to -0.1%, and in total production-related waste changes from -4.9% to -7.1%. The percentage change from 1996 to 1998 in recycling on-site changes from -3.4% to -6.0%, in treatment on-site changes from 7.7% to 2.4%, and in total production-related waste changes from -7.5% to -12.7%.



## Chapter 4 — TRI Data for Textile Mill Products



**Figure 4-10. Projected Percentage Change in Quantities of TRI Chemicals in Waste, 1996-1998: Textile Mill Products (SIC Code 22)**

**Note:** Current year and projected year amount are all taken from Section 8 of Form R for 1996. One facility reported incorrectly in SIC code 22 for 1996. The facility should have reported in SIC code 28. Another facility incorrectly reported amounts and projections for on-site treatment. (See note on Table 4-10.) The percentage change from 1996 to 1997 in on-site waste management changes from 5.0% to 2.6% and in total production-related waste changes from -2.5% to -6.1%. The percentage change from 1996 to 1998 in on-site waste management changes from 4.0% to 0.3% and in total production-related waste changes from -7.3% to -12.7%.

**Table 4-11. Number of Forms Reporting Source Reduction Activity, 1996: Textile Mill Products, SIC Code 22**

SIC Code	Industry	Total Forms Number	Forms Reporting Source Reduction Activities		Category of Source Reduction Activity							
			Number	Percent of All Forms	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Material Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
2211	Broadwoven Fabric Mills, Cotton	19	0	0.0	0	0	0	0	0	0	0	0
2221	Broadwoven Fabric Mills, Manmade	22	6	27.3	4	0	0	4	0	0	2	0
2231	Broadwoven Fabric Mills, Wool	25	4	16.0	2	0	0	2	0	0	0	0
2251	Women's Hosiery, Except Socks	3	0	0.0	0	0	0	0	0	0	0	0
2252	Hosiery, nec*	4	0	0.0	0	0	0	0	0	0	0	0
2253	Knit Outerwear Mills	13	0	0.0	0	0	0	0	0	0	0	0
2254	Knit Underwear Mills	1	0	0.0	0	0	0	0	0	0	0	0
2257	Weft Knit Fabric Mills	3	0	0.0	0	0	0	0	0	0	0	0
2258	Lace & Warp Knit Fabric Mills	3	1	33.3	1	0	0	0	0	0	0	0
2259	Knitting Mills, nec*	2	2	100.0	2	2	0	2	0	0	0	0
2261	Finishing Plants, Cotton	34	3	8.8	0	0	0	1	2	0	0	0
2262	Finishing Plants, Manmade	34	9	26.5	3	2	1	4	0	0	2	1
2269	Finishing Plants, nec*	67	19	28.4	9	0	2	8	1	0	0	0
2273	Carpets & Rugs	59	10	16.9	0	0	0	6	3	0	0	1
2281	Yarn Spinning Mills	2	0	0.0	0	0	0	0	0	0	0	0
2282	Throwing & Winding Mills	5	1	20.0	1	0	0	0	0	0	0	0
2284	Thread Mills	9	6	66.7	2	0	0	1	1	0	1	2
2295	Coated Fabrics, Not Rubberized	158	58	36.7	28	9	2	14	17	0	7	7
2296	Tire Cord & Fabrics	25	2	8.0	0	0	2	0	0	0	0	2
2297	Nonwoven Fabrics	12	3	25.0	3	0	0	0	0	0	0	0
2298	Cordage & Twine	5	0	0.0	0	0	0	0	0	0	0	0
2299	Textile Goods, nec*	27	6	22.2	1	0	0	4	0	1	0	0
Multiple within SIC Code 22		120	14	11.7	2	1	3	6	3	0	2	3
Invalid SIC Code within SIC Code 22		5	0	0.0	0	0	0	0	0	0	0	0
Total for SIC Code 22		657	144	21.9	58	14	10	52	27	1	14	16

**Note:** Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category.

\*nec: not elsewhere classified.



In both these industries, as in the sector as a whole, good operating practices was the source reduction activity most often reported. In the coated fabrics industry, process modifications was the next most frequent activity indicated. For miscellaneous finishing plants, raw material modifications ranked second, as shown in Table 4-11.

## Year-to-Year Comparisons for Textile Mill Products

### 1995-1996 TRI Data for Textile Mill Products

From 1995 to 1996, the number of forms submitted in the textile mills sector decreased 11.9% from 746 forms to 657. Submissions of both Form Rs and Form As declined, as shown in Table 4-12. In most of the other sectors reporting to TRI, the number of Form As increased. (The Form A certification statement is explained in Chapter 1.)

#### On- and Off-site Releases

Table 4-12 shows the textile mills sector's reporting of on- and off-site releases in 1995 and 1996. Total releases for the sector decreased 6.3%, from 18.5 million pounds in 1995 to 17.3 million pounds in 1996. Figure 4-11 displays the percentage change from 1995 to 1996 in the types of release.

The largest reduction in absolute terms, 1.3 million pounds, occurred in reported air emissions. Decreases in both fugitive and point source emissions contributed to this reduction. Among other on-site release types, both surface water discharges and on-site land releases showed small increases. A small decrease was reported in off-site releases (transfers to disposal).

#### Other On-site Waste Management

All three methods of other on-site waste management showed increases from 1995 to 1996 in textile mills reporting. Total other on-site waste management was 32.6 million pounds in 1995 and 42.0 million pounds in 1996, an increase of 29.0%. These data also appear in Table 4-12. The largest change, in both pounds and percent, was reported in on-site treatment, which increased from 17.0 million pounds to 23.6 million pounds, a 39.4% increase. However, the facility that erroneously reported on-site treatment of sulfuric acid in 1996 did not report in 1995; thus the 1995-1996 change reflects an apparent increase for one form from no data in 1995 to 10.7 million pounds in 1996. Another facility also reported a smaller amount (11,000 pounds) of on-site treatment in error. When adjusted for these reporting errors, on-site treatment shows a decrease of 23.7%.

On-site recycling increased from 10.7 million pounds to 13.1 million pounds, or 22.2%. This category also reflects an apparent increase from a reporting error, from no data in 1995 to 4.4 million pounds in 1996. Taking this error into account, on-site recycling decreased 19.1%.

The textile mills sector reported 4.9 million pounds of on-site energy recovery in 1995 and 5.3 million pounds in 1996, an increase of 8.2%.

#### Transfers Off-site for Further Waste Management

Table 4-12 also presents transfers off-site for further waste management reported in the textile mills sector in 1995 and 1996. These transfers decreased from 6.5 million pounds to 5.8 million pounds during this period, an 11.3% reduction. All types of off-site transfers for further waste management decreased, except transfers to recycling, which rose from 798,000 pounds in 1995 to 1.0 million pounds in 1996. The largest absolute reduction was reported in transfers to POTWs, from 2.9 million pounds to 2.3 million pounds.



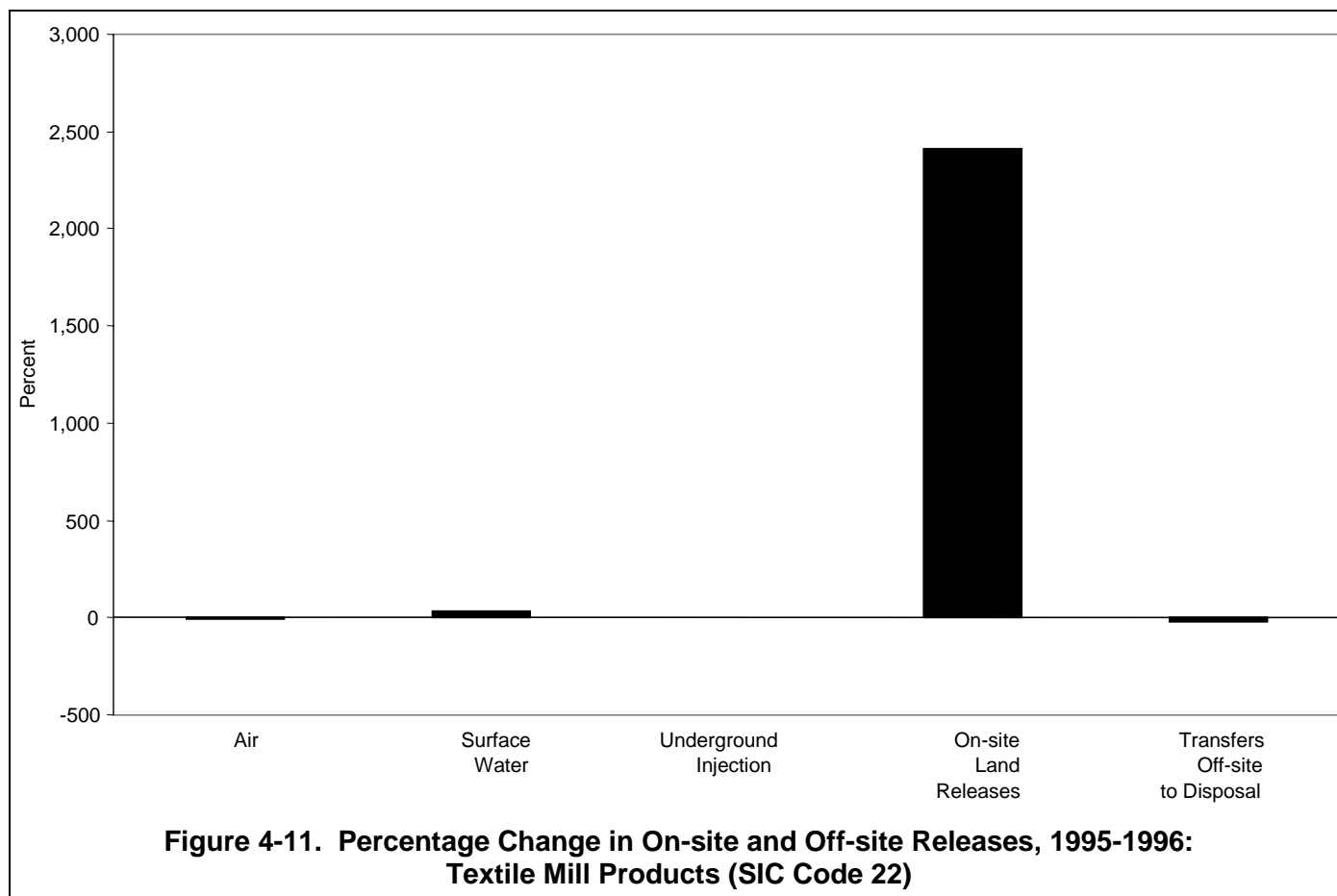
## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-12. Comparison of TRI On-site and Off-site Releases, Other On-site Waste Management, and Transfers Off-site for Further Waste Management, 1995-1996: Textile Mill Products, SIC Code 22**

	1995 Number	1996 Number	Change 1995 to 1996 Percent
Total Facilities	359	307	-14.5
Total Forms	746	657	-11.9
Form Rs	695	622	-10.5
Form As	51	35	-31.4
	Pounds	Pounds	Percent
<u>On-site Releases</u>			
Total Air Emissions	17,644,007	16,342,885	-7.4
Fugitive Air	3,923,841	3,217,057	-18.0
Point Source Air	13,720,166	13,125,828	-4.3
Surface Water Discharges	268,850	348,877	29.8
Underground Injection	0	0	--
On-site Land Releases	6,903	173,620	2,415.1
Total On-site Releases	17,919,760	16,865,382	-5.9
<u>Off-site Releases</u>			
Transfers Off-site to Disposal	581,734	462,148	-20.6
Total On- and Off-site Releases	18,501,494	17,327,530	-6.3
<u>Other On-site Waste Management</u>			
Recycled On-site	10,705,090	13,085,659	22.2
Energy Recovery On-site	4,924,870	5,326,659	8.2
Treated On-site	16,955,300	23,627,782	39.4
Total Other On-site Waste Management	32,585,260	42,040,100	29.0
<u>Transfers Off-site for Further Waste Management</u>			
Transfers to Recycling	797,741	1,013,876	27.1
Transfers to Energy Recovery	2,078,319	1,926,069	-7.3
Transfers to Treatment	731,874	523,939	-28.4
Transfers to POTWs	2,877,882	2,287,565	-20.5
Other-Off-site Transfers	0	0	--
Total Transfers Off-site for Further Waste Management	6,485,816	5,751,449	-11.3

**Note:** **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Other On-site Waste Management** from Section 8 of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required in 1995. Other Off-site Transfers are transfers reported without a valid waste management code. One facility reported incorrectly in SIC code 22 for 1996. The facility should have reported in SIC code 28. The incorrectly reported amounts were as follows: 4,426,812 pounds of recycling and 10,475 pounds of treatment on-site. One facility incorrectly reported 10,679,852 pounds of treatment on-site for 1996. The correct amount is 0 pounds. The percentage change from 1995 to 1996 in recycling on-site changes from 22.2% to -19.1%, in treatment on-site changes from 39.4% to -23.7%, and in total other on-site waste management changes from 29.0% to -17.4%.





**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required in 1995.

### Changes in SIC Codes

As indicated in facility descriptions below, some facilities report different SIC codes over time. This may reflect new or discontinued lines of production, or it may represent a different understanding of how SIC code designations relate to a facility's business activities. These changes can contribute—sometimes largely—to apparent increases or decreases across comparison years in the amounts reported by the four-digit, or even two-digit, SIC codes.

### 1988-1996 TRI Data for Textile Mill Products

As explained in Chapter 1, comparisons from the 1988 TRI baseline year to the current year rely on the list of “core” TRI chemicals that were reportable, with the same reporting definition, in all years. These multi-year comparisons also review only the data elements that were collected in all years, which excludes from this section any analysis that distinguishes RCRA subtitle C landfills from other land releases as well as analysis based on the types of underground injection wells.



## Chapter 4 — TRI Data for Textile Mill Products

On-site waste management data and transfers off-site to recycling and to energy recovery have been collected only since 1991; these data are included, but cannot be compared across the full 1988-1996 period.

The number of forms submitted by the textile mill products decreased from 664 in 1988 to 509 in 1996, a 23.3% reduction, as shown in Table 4-13.

From 1988 to 1996, total on- and off-site releases reported in SIC code 22 decreased by more than half (57.3%). As shown in Table 4-13, the sector reported 35.8 million pounds of releases in 1988 and 15.3 million pounds in 1996. All categories of releases decreased by 50.0% or more. The largest reduction in pounds was reported in air emissions, from 33.6 million pounds in 1988 to 14.8 million pounds in 1996, a decrease of 18.8 million pounds. Approximately two-thirds of this reduction occurred in reporting of point source emissions. Smaller absolute reductions were reported in surface water discharges (from 468,000 pounds in 1988 to 58,000 pounds in 1996) and in on-site releases (from 80,000 pounds to 16,000 pounds).

Figure 4-12 displays the percentage reductions in on- and off-site releases from 1988 to 1996.

On-site waste management and transfers off-site for recycling or energy recovery were not collected in 1988. For the 1994-1996 period, the net reduction in other on-site waste management in this sector was 1.3 million pounds, from 28.6 million pounds to 27.3 million pounds. However, the 1996 total includes a reporting error of 4.4 million pounds in on-site recycling. Taking into account this error, on-site waste management decreased by 5.7 million pounds, from 28.6 million pounds in 1994 to 22.9 million pounds in 1996.

For the types of transfers off-site for further waste management that were reported in all years, 1988-1996, transfers to treatment decreased from 1.4 million pounds to 512,000 pounds, and transfers to

POTWs decreased from 9.8 million pounds to 1.7 million pounds. These were reductions of 62.7% and 83.0%, respectively.

### 1988-1996 Data for Four-Digit Industries in Textile Mill Products

Tables 4-14 through 4-16 summarize data for 1988 and 1994-1996 for industries at the four-digit SIC code level within SIC code 22. The tables present, respectively, on- and off-site releases, other on-site waste management, and transfers off-site for further waste management.

#### **On- and Off-site Releases**

Table 4-14 provides release data for 1988 to 1996 for all four-digit SIC codes in the textile mills sector. The largest 1988-1996 increase in on- and off-site releases in the textile mills sector was reported by the coated fabrics industry (SIC code 2295). This industry's releases totaled 18.9 million pounds in 1988 and 9.7 million pounds in 1996. Almost all of this 9.1 million-pound reduction was reported in air emissions.

The multiple-codes group (forms with more than one SIC code in SIC code 22) had a 2.3 million-pound reduction, from 3.3 million pounds to 925,000 pounds. Most of this reduction also was reported in air emissions. Carpets and rugs (SIC code 2273) had a reduction of 2.0 million pounds, from 2.3 million pounds in 1988 to 274,000 pounds in 1996. More than half of this reduction occurred in off-site releases (transfers to disposal) and the balance was principally in air emissions.

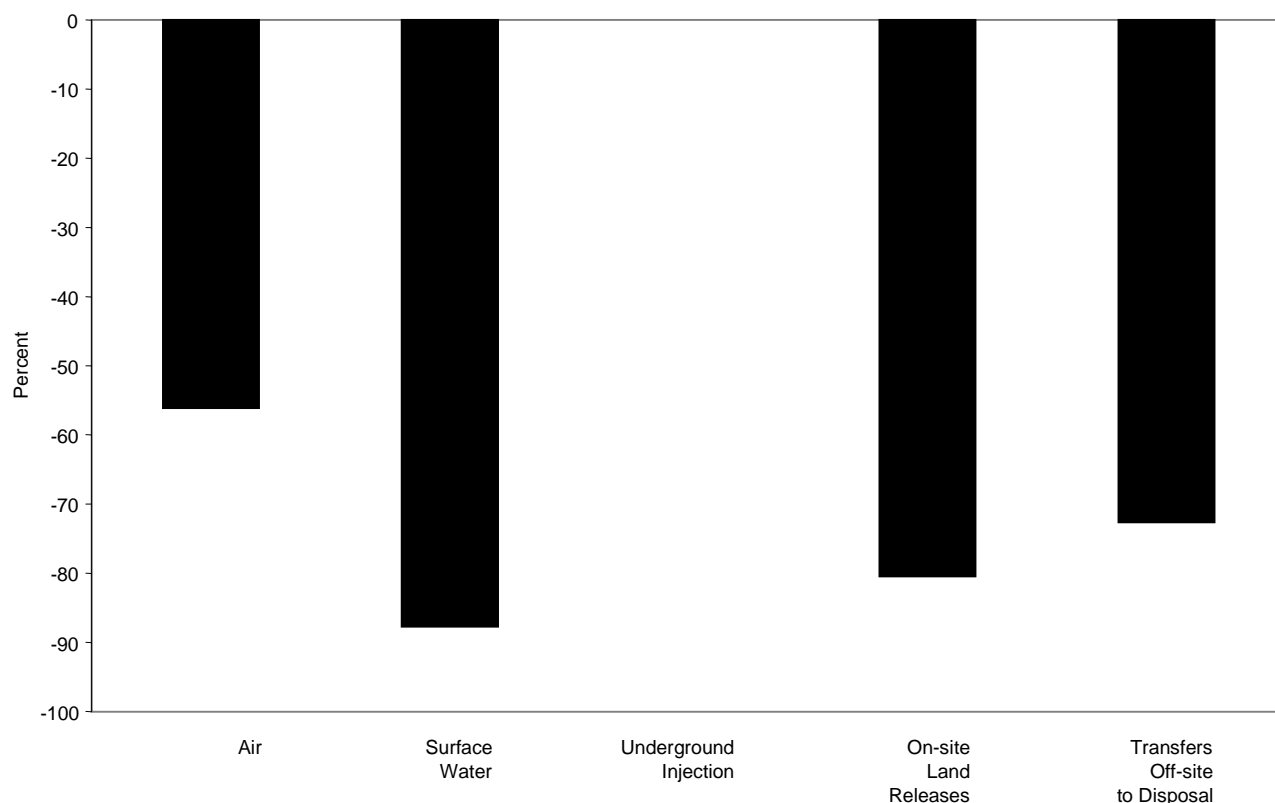
Thread mills (SIC code 2284) reported an increase in on- and off-site releases of 1.0 million pounds. This industry reported 26,000 pounds in 1988 and 1.1 million pounds in 1996, mostly released to air. However, reporting of releases by thread mills has decreased over the last three years. No other industry in this sector had an increase of more than 150,000 pounds.



**Table 4-13. Comparison of TRI On-site and Off-site Releases, Other On-site Waste Management, and Transfers Off-site for Further Waste Management, 1988 and 1994-1996: Textile Mill Products, SIC Code 22**

	1988 Number	1994 Number	1995 Number	1996 Number	Change 1988 to 1996 Percent
Total Facilities	336	328	311	259	-22.9
Total Forms	664	617	589	509	-23.3
Form Rs	664	617	548	480	-27.7
Form As	NA	NA	41	29	NA
	Pounds	Pounds	Pounds	Pounds	Percent
<u>On-site Releases</u>					
Total Air Emissions	33,605,487	15,667,454	15,061,062	14,756,746	-56.1
Fugitive Air	9,473,343	3,237,526	3,121,677	2,775,116	-70.7
Point Source Air	24,132,144	12,429,928	11,939,385	11,981,630	-50.3
Surface Water Discharges	468,191	110,838	74,205	57,550	-87.7
Underground Injection	0	4	0	0	--
On-site Land Releases	79,850	14,892	6,898	15,620	-80.4
Total On-site Releases	34,153,528	15,793,188	15,142,165	14,829,916	-56.6
<u>Off-site Releases</u>					
Transfers Off-site to Disposal	1,644,849	553,144	513,442	450,495	-72.6
Total On- and Off-site Releases	35,798,377	16,346,332	15,655,607	15,280,411	-57.3
<u>Other On-site Waste Management</u>					
Recycled On-site	NA	13,274,492	10,519,581	13,069,987	NA
Energy Recovery On-site	NA	4,001,813	4,205,406	4,613,222	NA
Treated On-site	NA	11,335,942	10,936,222	9,616,522	NA
Total Other On-site Waste Management	NA	28,612,247	25,661,209	27,299,731	NA
<u>Transfers Off-site for Further Waste Management</u>					
Transfers to Recycling	NA	719,188	724,971	905,873	NA
Transfers to Energy Recovery	NA	1,269,996	1,879,711	1,691,264	NA
Transfers to Treatment	1,373,980	503,222	553,910	512,220	-62.7
Transfers to POTWs	9,763,696	2,091,126	2,037,329	1,659,240	-83.0
Other Off-site Transfers	109,478	0	0	0	-100.0
Total Transfers Off-site for Further Waste Management	NA	4,583,532	5,195,921	4,768,597	NA

**Note:** Does not include delisted chemicals, chemicals added in 1990, 1991, 1994, and 1995, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Other On-site Waste Management** from Section 8 of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required before 1996. For 1994-1996, Other Off-site Transfers are transfers reported without a valid waste management code. For 1988, Other Off-site Transfers are transfers reported without a valid waste management code or codes not required to be reported in 1988. One facility reported incorrectly in SIC code 22 for 1996. The facility should have reported in SIC code 28. The incorrectly reported amounts were as follows: 4,426,812 pounds of recycling on-site, 10,475 pounds of treatment on-site and 4,437,287 pounds of total other on-site waste management. **NA:** not required to be reported in that year.



**Figure 4-12. Percentage Change in On-site and Off-site Releases, 1988-1996: Textile Mill Products (SIC Code 22)**

**Note:** Does not include delisted chemicals, chemicals added in 1990, 1991, 1994, and 1995, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required before 1996.

### Other On-site Waste Management

For 1994-1996, the largest reduction in other on-site waste management in the textile mills sector was reported by the multiple SIC codes group (on-site waste management data were not collected in 1988). This group reported 6.4 million pounds of other on-site waste management in 1994 and 1.9 million pounds in 1996. This 4.5 million-pound reduction reflected a 3.5 million-pound reduction in on-site recycling and a 1.0 million-pound reduction in on-site treatment. The carpet and rug industry (SIC code 2273) had a reduction of 1.4 million pounds, from 2.0 million pounds in 1994 to 648,000 pounds in 1996. This decrease occurred in the reporting of on-site treatment. Coated fabrics (SIC code 2295) reported a 1.0 million-pound reduction, from 9.6 million pounds in 1994 to 8.6

million pounds in 1996. This represented a larger reduction in on-site recycling, partly offset by increases in on-site energy recovery and treatment.

The largest reported increase in on-site waste management reflected reporting errors, previously described, in the miscellaneous finishing plants industry (SIC code 2269). Taking into account the errors, the industry ranking first for increases in other on-site waste management was finishing plants, manmade (SIC code 2262). This industry reported 4.3 million pounds in 1994 and 5.0 million pounds in 1996, a difference of 670,000 pounds. This change consisted of an increase in recycling, which was partly offset by decreases in energy recovery and treatment. Other industry increases for 1994-1996 were less than 100,000 pounds each.



Table 4-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22

SIC Code	Industry	Year	On-site Releases				Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds		Transfers Off-site to Disposal Pounds	
2211	Broadwoven Fabric Mills, Cotton	96	215,100	0	0	250	215,350	250	215,600
		95	266,762	250	0	500	267,512	1,450	268,962
		94	542,272	505	0	0	542,777	0	542,777
		88	589,761	12,000	0	0	601,761	0	601,761
2221	Broadwoven Fabric Mills, Manmade	96	466,136	330	0	0	466,466	48,713	515,179
		95	278,355	540	0	0	278,895	4,720	283,615
		94	378,519	3,010	0	0	381,529	18,049	399,578
		88	927,453	44	0	0	927,497	7,660	935,157
2231	Broadwoven Fabric Mills, Wool	96	58,103	14,854	0	1,801	74,758	2,093	76,851
		95	57,071	3,202	0	1,811	62,084	752	62,836
		94	53,176	15,018	0	3,010	71,204	829	72,033
		88	1,331,321	6,271	0	7,620	1,345,212	500	1,345,712
2241	Narrow Fabric Mills	96	No reports received						
		95	11,000	0	0	0	11,000	0	11,000
		94	91,177	0	0	0	91,177	0	91,177
		88	73,188	0	0	0	73,188	0	73,188
2251	Women's Hosiery, Except Socks	96	181	0	0	0	181	0	181
		95	173	0	0	0	173	0	173
		94	0	0	0	0	0	0	0
		88	0	0	0	0	0	0	0
2252	Hosiery, nec*	96	2	0	0	0	2	0	2
		95	465	0	0	0	465	0	465
		94	3,997	0	0	0	3,997	0	3,997
		88	0	0	0	0	0	0	0
2253	Knit Outerwear Mills	96	6,470	0	0	13,125	19,595	12	19,607
		95	401	0	0	0	401	0	401
		94	7,140	0	0	0	7,140	0	7,140
		88	85,558	0	0	0	85,558	0	85,558
2254	Knit Underwear Mills	96	0	0	0	0	0	0	0
		95	5,437	0	0	0	5,437	0	5,437
		94	26,566	0	4	0	26,570	0	26,570
		88	0	839	0	0	839	0	839
2257	Weft Knit Fabric Mills	96	40,011	0	0	0	40,011	0	40,011
		95	54,045	0	0	0	54,045	31,889	85,934
		94	62,480	0	0	0	62,480	41,000	103,480
		88	424,455	11,225	0	0	435,680	9,136	444,816
2258	Lace & Warp Knit Fabric Mills	96	10	250	0	5	265	0	265
		95	1,450	1,237	0	0	2,687	0	2,687
		94	1,000	660	0	0	1,660	0	1,660
		88	335,205	0	0	0	335,205	0	335,205
2259	Knitting Mills, nec*	96	0	0	0	0	0	7,395	7,395
		95	No reports received						
		94	No reports received						
		88	587,087	3,005	0	750	590,842	4,388	595,230

**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility incorrectly reported 393,101 pounds of air emissions and total releases under SIC code 2269 for 1996. The correct amount is 42,493 pounds. Another facility reporting in SIC code 2295 did not report for 1988, but should have. The correct amounts are 687,336 pounds of total air emissions and total releases.

\*nec: not elsewhere classified.



## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22, Continued**

SIC Code	Industry	Year	On-site Releases				Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds		Transfers Off-site to Disposal Pounds	
2261	Finishing Plants, Cotton	96	81,882	0	0	0	81,882	0	81,882
		95	40,676	0	0	0	40,676	0	40,676
		94	30,976	5	0	0	30,981	7,000	37,981
		88	230,169	13,272	0	4,450	247,891	3,500	251,391
2262	Finishing Plants, Manmade	96	261,041	196	0	0	261,237	42,763	304,000
		95	376,936	30	0	1,499	378,465	11,366	389,831
		94	450,783	3,030	0	0	453,813	7,003	460,816
		88	986,737	48,711	0	0	1,035,448	21,660	1,057,108
2269	Finishing Plants, nec*	96	1,392,352	4,869	0	5	1,397,226	5	1,397,231
		95	762,394	4,002	0	286	766,682	10	766,692
		94	1,041,602	6,236	0	4	1,047,842	20	1,047,862
		88	1,218,675	133,262	0	58,080	1,410,017	1,252	1,411,269
2273	Carpets and Rugs	96	265,374	2,860	0	0	268,234	5,493	273,727
		95	240,688	3,862	0	0	244,550	4,430	248,980
		94	233,064	3,905	0	0	236,969	3,400	240,369
		88	1,197,119	5,600	0	0	1,202,719	1,072,657	2,275,376
2281	Yarn Spinning Mills	96	12,300	0	0	0	12,300	0	12,300
		95	39,541	0	0	0	39,541	0	39,541
		94	36,791	0	0	0	36,791	0	36,791
		88	74,001	0	0	0	74,001	0	74,001
2282	Throwing and Winding Mills	96	42,197	0	0	0	42,197	0	42,197
		95	107,429	0	0	0	107,429	0	107,429
		94	177,759	0	0	3,650	181,409	0	181,409
		88	241,412	0	0	0	241,412	23,000	264,412
2284	Thread Mills	96	1,059,110	0	0	0	1,059,110	0	1,059,110
		95	1,772,812	0	0	0	1,772,812	1,847	1,774,659
		94	2,397,654	0	0	0	2,397,654	283	2,397,937
		88	25,950	0	0	0	25,950	0	25,950
2295	Coated Fabrics, Not Rubberized	96	9,506,419	270	0	0	9,506,689	233,806	9,740,495
		95	9,062,104	285	0	0	9,062,389	293,691	9,356,080
		94	7,683,950	290	0	750	7,684,990	278,664	7,963,654
		88	18,571,457	4,250	0	0	18,575,707	301,215	18,876,922
2296	Tire Cord and Fabrics	96	124,328	360	0	10	124,698	55,997	180,695
		95	124,375	976	0	10	125,361	51,007	176,368
		94	109,111	902	0	0	110,013	38,424	148,437
		88	65,147	0	0	0	65,147	250	65,397
2297	Nonwoven Fabrics	96	139,675	0	0	0	139,675	0	139,675
		95	77,179	0	0	0	77,179	750	77,929
		94	66,962	0	0	0	66,962	0	66,962
		88	284,920	55	0	0	284,975	32,550	317,525
2298	Cordage and Twine	96	106,331	0	0	0	106,331	0	106,331
		95	105,220	0	0	3	105,223	5	105,228
		94	130,191	0	0	3	130,194	5	130,199
		88	142,381	0	0	0	142,381	0	142,381

**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility incorrectly reported 393,101 pounds of air emissions and total releases under SIC code 2269 for 1996. The correct amount is 42,493 pounds. Another facility reporting in SIC code 2295 did not report for 1988, but should have. The correct amounts are 687,336 pounds of total air emissions and total releases.

\*nec: not elsewhere classified.



**Table 4-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22, Continued**

SIC Code	Industry	Year	On-site Releases				Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds		Transfers Off-site to Disposal Pounds	
2299	Textile Goods, nec*	96	125,901	800	0	0	126,701	13,316	140,017
		95	134,193	800	0	0	134,993	40,480	175,473
		94	160,073	3,102	0	0	163,175	7,359	170,534
		88	629,324	70,208	0	1,200	700,732	10,281	711,013
	Multiple within SIC Code 22	96	851,039	32,761	0	424	884,224	40,652	924,876
		95	1,480,107	59,011	0	2,789	1,541,907	71,045	1,612,952
		94	1,787,616	74,160	0	7,470	1,869,246	151,103	2,020,349
		88	3,057,451	56,949	0	7,500	3,121,900	146,926	3,268,826
	Invalid SIC Code within SIC Code 22	96	2,784	0	0	0	2,784	0	2,784
		95	62,249	10	0	0	62,259	0	62,259
		94	194,595	15	0	5	194,615	5	194,620
		88	2,526,716	102,500	0	250	2,629,466	9,874	2,639,340
	Total for SIC Code 22	96	14,756,746	57,550	0	15,620	14,829,916	450,495	15,280,411
		95	15,061,062	74,205	0	6,898	15,142,165	513,442	15,655,607
		94	15,667,454	110,838	4	14,892	15,793,188	553,144	16,346,332
		88	33,605,487	468,191	0	79,850	34,153,528	1,644,849	35,798,377

**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility incorrectly reported 393,101 pounds of air emissions and total releases under SIC code 2269 for 1996. The correct amount is 42,493 pounds. Another facility reporting in SIC code 2295 did not report for 1988, but should have. The correct amounts are 687,336 pounds of total air emissions and total releases.

\*nec: not elsewhere classified.

On-site waste management data for 1994-1996 appear in Table 4-15.

### Transfers Off-site for Further Waste Management

The multiple SIC codes group reported the largest decrease in transfers off-site for further waste management in this sector for 1994-1996 (data for some types of off-site transfers were not collected in 1988). This was a reduction from 864,000 pounds in 1994 to 664,000 pounds in 1996, despite an increase in 1995. The net reduction of 200,000 pounds was attributable primarily to transfers to POTWs. The sector's reported transfers off-site for further waste management are shown in Table 4-16.

Reported transfers off-site for further waste management in the miscellaneous finishing plants

industry (SIC code 2269) decreased from 995,000 pounds in 1994 to 877,000 pounds in 1996, a reduction of 118,000 pounds. The transfer type with the largest reduction in this industry's reporting was transfers to POTWs.

The coated fabrics industry (SIC code 2295) had the largest reported increase of any industry in the textile mills sector for transfers off-site for further waste management, from 1.6 million pounds in 1994 to 2.1 million pounds in 1996. This 437,000 pound increase was due to increases in transfers to energy recovery and to recycling. Carpets and rugs (SIC code 2273) had an increase of 110,000 pounds for the 1994-1996 period, from 129,000 pounds to 239,000 pounds. This was entirely attributable to reported transfers to POTWs.

No other industry had a decrease or increase in such transfers of more than 100,000 pounds from 1994 to 1996.



## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22**

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
2211	Broadwoven Fabric Mills, Cotton	96	0	0	1,037	1,037
		95	0	0	3,053	3,053
		94	0	0	32,341	32,341
		88	NA	NA	NA	NA
2221	Broadwoven Fabric Mills, Manmade	96	82,273	0	20,346	102,619
		95	28,207	1,000	32,213	61,420
		94	0	0	82,766	82,766
		88	NA	NA	NA	NA
2231	Broadwoven Fabric Mills, Wool	96	0	0	213,283	213,283
		95	0	0	161,148	161,148
		94	0	0	153,342	153,342
		88	NA	NA	NA	NA
2241	Narrow Fabric Mills	96	No reports received			
		95	0	0	0	0
		94	0	0	21,000	21,000
		88	NA	NA	NA	NA
2251	Women's Hosiery, Except Socks	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
2252	Hosiery, nec*	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
2253	Knit Outerwear Mills	96	0	0	22,100	22,100
		95	0	0	14,110	14,110
		94	0	0	28,000	28,000
		88	NA	NA	NA	NA
2254	Knit Underwear Mills	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
2257	Weft Knit Fabric Mills	96	38,476	0	18,322	56,798
		95	55,084	0	19,604	74,688
		94	34,526	0	18,030	52,556
		88	NA	NA	NA	NA
2258	Lace & Warp Knit Fabric Mills	96	0	0	420	420
		95	0	0	13,304	13,304
		94	0	0	12,540	12,540
		88	NA	NA	NA	NA
2259	Knitting Mills, nec*	96	6,800	0	0	6,800
		95	No reports received			
		94	No reports received			
		88	NA	NA	NA	NA

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility reported incorrectly in SIC code 2269 for 1996. The facility should have reported in SIC code 2869. The incorrectly reported amount was 4,437,287 pounds of other on-site waste management.

\*nec: not elsewhere classified.





**Table 4-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22, Continued**

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
2261	Finishing Plants, Cotton	96	9,000	9,000	49,300	67,300
		95	8,000	8,000	97,100	113,100
		94	10,000	10,000	19,500	39,500
		88	NA	NA	NA	NA
2262	Finishing Plants, Manmade	96	3,849,529	1,114,500	46,532	5,010,561
		95	4,146,394	1,053,500	16,499	5,216,393
		94	2,967,489	1,250,600	122,133	4,340,222
		88	NA	NA	NA	NA
2269	Finishing Plants, nec*	96	6,269,432	949,096	2,159,078	9,377,606
		95	2,212,196	915,866	1,794,358	4,922,420
		94	1,675,862	749,740	2,016,061	4,441,663
		88	NA	NA	NA	NA
2273	Carpets and Rugs	96	6,000	0	642,381	648,381
		95	15,000	0	790,001	805,001
		94	351	0	2,007,685	2,008,036
		88	NA	NA	NA	NA
2281	Yarn Spinning Mills	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
2282	Throwing and Winding Mills	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
2284	Thread Mills	96	0	0	77,022	77,022
		95	0	0	262,339	262,339
		94	0	0	94,100	94,100
		88	NA	NA	NA	NA
2295	Coated Fabrics, Not Rubberized	96	1,979,638	2,540,623	4,040,614	8,560,875
		95	2,816,766	2,225,969	4,408,646	9,451,381
		94	4,350,620	1,991,473	3,214,443	9,556,536
		88	NA	NA	NA	NA
2296	Tire Cord and Fabrics	96	0	0	229,723	229,723
		95	0	0	189,213	189,213
		94	0	0	173,922	173,922
		88	NA	NA	NA	NA
2297	Nonwoven Fabrics	96	520,839	0	100,000	620,839
		95	408,946	0	174,200	583,146
		94	442,000	0	151,370	593,370
		88	NA	NA	NA	NA
2298	Cordage and Twine	96	0	0	0	0
		95	0	0	0	0
		94	0	0	91,245	91,245
		88	NA	NA	NA	NA

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the “multiple” category. One facility reported incorrectly in SIC code 2269 for 1996. The facility should have reported in SIC code 2869. The incorrectly reported amount was 4,437,287 pounds of other on-site waste management.

\*nec: not elsewhere classified.



## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22, Continued**

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
2299	Textile Goods, nec*	96	5,000	0	342,320	347,320
		95	0	0	394,201	394,201
		94	0	0	437,810	437,810
		88	NA	NA	NA	NA
	Multiple within SIC Code 22	96	303,000	3	1,593,061	1,896,064
		95	828,788	1,071	2,414,171	3,244,030
		94	3,789,405	0	2,640,497	6,429,902
		88	NA	NA	NA	NA
	Invalid SIC Code within SIC Code 22	96	0	0	60,983	60,983
		95	200	0	152,062	152,262
		94	4,239	0	19,157	23,396
		88	NA	NA	NA	NA
	Total for SIC Code 22	96	13,069,987	4,613,222	9,616,522	27,299,731
		95	10,519,581	4,205,406	10,936,222	25,661,209
		94	13,274,492	4,001,813	11,335,942	28,612,247
		88	NA	NA	NA	NA

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category. One facility reported incorrectly in SIC code 2269 for 1996. The facility should have reported in SIC code 2869. The incorrectly reported amount was 4,437,287 pounds of other on-site waste management.

\*nec: not elsewhere classified.

### Facilities with Large Increases and Decreases in Releases, 1988-1996

American & Efird, Inc., in Mount Holly, North Carolina (SIC code 2221 in 1988 and 2284 in 1996), ranked first for increases with an overall 191,000 pound increase. This facility produces threads used in air bag production, the shoe industry, and other manufacturing. Air emissions of dichloromethane, which is used in a coating process, accounted for 59% of the increase. A production increase was cited as the reason for the increase.

Uniroyal Engineered Products in Port Clinton, Ohio (SIC code 2295), was second for increases with a 140,000 pound total. Toluene accounted for 65% of the plant's increase. The facility manufactures a flexible PVC, Naugahyde®-like product used in automobile upholstery. Two reasons were cited for the increase: a switch was made to a urethane top finish in which toluene is a solvent and a machine

was installed that bonds a polypropylene foam backing to the PVC product. The bonding process involves the use of a polyester resin in toluene solution.

Fil-Tec, Inc., in Cavetown, Maryland (did not report in 1988, SIC code 2284 in 1996), ranked third with an overall 134,000 pound increase. Fil-Tec, which began operation after the 1988 reporting year, produces bonded sewing threads used in wire and cable products, upholstered furniture, shoes, bedding, canvas goods, and other products. Methanol was the only chemical reported in 1996, and because the company did not report in 1988, this chemical's 1996 releases accounted for 100% of the facility's increase. Methanol is used as a solvent in bonded thread production. A facility contact stated that the 1998 data for methanol stack emissions will drop to 14% of the 1996 amount due to the installation of new emissions control equipment.



**Table 4-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22**

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
2211	Broadwoven Fabric Mills, Cotton	96	0	0	0	50,400	0	50,400
		95	0	0	0	21,800	0	21,800
		94	0	0	19,900	64,429	0	84,329
		88	NA	NA	0	20,848	0	NA
2221	Broadwoven Fabric Mills, Manmade	96	43,230	16,400	30	67,260	0	126,920
		95	86,900	21,505	45	68,533	0	176,983
		94	2,250	21,700	14,015	4,266	0	42,231
		88	NA	NA	750	3,489,641	0	NA
2231	Broadwoven Fabric Mills, Wool	96	0	0	5,172	20,630	0	25,802
		95	614	0	454	25,720	0	26,788
		94	0	0	0	26,800	0	26,800
		88	NA	NA	4,845	82,289	0	NA
2241	Narrow Fabric Mills	96	No reports received					
		95	0	0	0	0	0	0
		94	0	0	2,750	0	0	2,750
		88	NA	NA	0	10,542	0	NA
2251	Women's Hosiery, Except Socks	96	0	0	0	0	0	0
		95	0	0	0	480	0	480
		94	0	0	0	686	0	686
		88	NA	NA	0	231,201	0	NA
2252	Hosiery, nec*	96	0	0	0	108,891	0	108,891
		95	0	0	0	6,981	0	6,981
		94	0	0	0	88,777	0	88,777
		88	NA	NA	0	457,751	0	NA
2253	Knit Outerwear Mills	96	0	0	0	17,738	0	17,738
		95	0	0	0	21,870	0	21,870
		94	1,861	0	0	92,380	0	94,241
		88	NA	NA	0	345,549	0	NA
2254	Knit Underwear Mills	96	0	0	0	24,153	0	24,153
		95	0	0	0	98,509	0	98,509
		94	0	0	0	62,413	0	62,413
		88	NA	NA	0	0	0	NA
2257	Weft Knit Fabric Mills	96	0	0	50,288	22,005	0	72,293
		95	0	0	45,327	19,305	0	64,632
		94	0	0	260	44,505	0	44,765
		88	NA	NA	0	229,357	250	NA
2258	Lace & Warp Knit Fabric Mills	96	0	0	0	0	0	0
		95	0	0	0	0	0	0
		94	0	0	0	0	0	0
		88	NA	NA	8	149,473	0	NA
2259	Knitting Mills, nec*	96	0	0	0	38	0	38
		95	No reports received					
		94	No reports received					
		88	NA	NA	0	0	0	NA

**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category.  
**\*nec:** not elsewhere classified.



## Chapter 4 — TRI Data for Textile Mill Products

**Table 4-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22, Continued**

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
2261	Finishing Plants, Cotton	96	0	0	0	156,216	0	156,216
		95	0	0	0	64,629	0	64,629
		94	0	0	0	77,331	0	77,331
		88	NA	NA	0	46,653	0	NA
2262	Finishing Plants, Manmade	96	0	0	4,455	63,761	0	68,216
		95	0	0	9,478	86,140	0	95,618
		94	0	0	5,729	60,539	0	66,268
		88	NA	NA	1,850	400,322	2,010	NA
2269	Finishing Plants, nec*	96	331,005	393,796	92,708	59,567	0	877,076
		95	326,000	222,382	36,272	93,234	0	677,888
		94	379,000	245,496	4,900	365,909	0	995,305
		88	NA	NA	11,540	572,951	0	NA
2273	Carpets and Rugs	96	336	0	842	237,593	0	238,771
		95	240	0	25,871	319,255	0	345,366
		94	0	0	1,072	127,614	0	128,686
		88	NA	NA	17,000	1,473,710	0	NA
2281	Yarn Spinning Mills	96	0	0	0	0	0	0
		95	0	0	0	0	0	0
		94	0	0	0	0	0	0
		88	NA	NA	0	0	0	NA
2282	Throwing and Winding Mills	96	0	6,327	0	12,817	0	19,144
		95	0	5,459	0	51,335	0	56,794
		94	0	6,856	0	47,303	0	54,159
		88	NA	NA	0	60,672	250	NA
2284	Thread Mills	96	0	63,262	0	78,792	0	142,054
		95	0	89,349	0	89,204	0	178,553
		94	0	72,054	0	96,180	0	168,234
		88	NA	NA	0	0	0	NA
2295	Coated Fabrics, Not Rubberized	96	531,302	1,197,886	334,562	10,535	0	2,074,285
		95	305,168	1,409,596	410,121	29,452	0	2,154,337
		94	328,502	857,888	432,283	18,742	0	1,637,415
		88	NA	NA	1,172,523	119,871	44,263	NA
2296	Tire Cord and Fabrics	96	0	0	11,162	2,036	0	13,198
		95	3,306	0	2,954	988	0	7,248
		94	4,178	0	1,942	2,530	0	8,650
		88	NA	NA	9,388	0	0	NA
2297	Nonwoven Fabrics	96	0	0	520	2,097	0	2,617
		95	0	0	5	1,005	0	1,010
		94	0	5	5	10	0	20
		88	NA	NA	48,500	250	49,570	NA
2298	Cordage and Twine	96	0	3,069	0	0	0	3,069
		95	0	4,388	5	250	0	4,643
		94	0	3,249	5	250	0	3,504
		88	NA	NA	3,106	0	0	NA

**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category.  
**\*nec:** not elsewhere classified.



**Table 4-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Textile Mill Products, SIC Code 22, Continued**

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
2299	Textile Goods, nec*	96	0	7,875	0	76,020	0	83,895
		95	0	3,020	1,765	71,750	0	76,535
		94	3,397	0	1,712	106,207	0	111,316
		88	NA	NA	8,100	158,686	12,000	NA
	Multiple within SIC Code 22	96	0	2,649	12,481	648,691	0	663,821
		95	2,743	124,012	15,920	915,789	0	1,058,464
		94	0	62,748	16,899	783,895	0	863,542
		88	NA	NA	75,345	803,518	885	NA
	Invalid SIC Code within SIC Code 22	96	0	0	0	0	0	0
		95	0	0	5,693	51,100	0	56,793
		94	0	0	1,750	20,360	0	22,110
		88	NA	NA	21,025	1,110,412	250	NA
	Total for SIC Code 22	96	905,873	1,691,264	512,220	1,659,240	0	4,768,597
		95	724,971	1,879,711	553,910	2,037,329	0	5,195,921
		94	719,188	1,269,996	503,222	2,091,126	0	4,583,532
		88	NA	NA	1,373,980	9,763,696	109,478	NA

**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 22 are assigned to the "multiple" category.  
**\*nec:** not elsewhere classified.

Gencorp in Columbus, Mississippi (SIC code 2295), ranked first in decreases with an overall 1.4 million-pound decrease. The manufacturer of vinyl upholstery and wall coverings uses methyl ethyl ketone (MEK) in printing processes. Since 1995, the plant has been converting from organic-solvated inks to water-based inks. This accounted for a 544,000 pound reduction in MEK usage, 40% of the overall decrease, through the 1996 reporting year.

Reeves International in Rutherfordton, North Carolina (SIC code 2295 in 1988; codes 2295, 3053, and 3069 in 1996), was second in decreases with 1.2 million pounds. The facility coats rubber and plastic onto textile substrates. Toluene, used as a solvent in several processes, accounted for 57% of the total decrease. One reason given for the reduction was a switch from neoprene to silicon rubber in some processes. Less toluene is required to process silicone rubber. Also cited were solvent

recovery and coating equipment upgrades that resulted in increased efficiency in solvent use and recovery.

Collins & Aikman in Old Fort, North Carolina (SIC codes 2270 and 2273 in 1988, did not report in 1996), ranked third in decreases with 1.1 million pounds. Reported transfers off-site to disposal of barium compounds were responsible for 86% of the decrease. Automotive carpet manufactured at the facility is backed by resin that contains barium sulfate. Prior to 1994, carpet was trimmed, packaged, and shipped from this Collins & Aikman facility. Carpet scrap was sent off-site to a landfill. Beginning in 1994, untrimmed carpet was sent to another facility for trimming and packaging. This facility also ranked third in decreases of waste managed. See "Facilities with Large Increases and Decreases in Waste Management, 1991-1996," below.



### **Other Apparent Increases and Decreases in Releases, 1988-1996**

In the TRI database, there are other facilities with large apparent increases and decreases, which have been identified as reporting errors or plant closures. Because these are errors or plant closures and not actual changes in the data, these facilities are not discussed in detail here. There are seven such facilities in the textiles sector:

Coats American, Bristol, Rhode Island, increase of 393,000 pounds, reporting error.

Excello Fabric Finishers, Inc., Coshocton, Ohio, increase of 335,000 pounds, reporting error.

Fieldcrest Cannon, Inc., Kannapolis, North Carolina, increase of 246,000 pounds, reporting error.

Neese Coated Fabrics, Saint Louis, Missouri, decrease of 1.2 million pounds, plant closure.

Paxar Corporation, Orangeburg, New York, decrease of 1.7 million pounds, reporting error.

Reeves Brothers, Inc., Buena Vista, Virginia, decrease of 1.2 million pounds, plant closure.

Uniroyal Engineered Products, Stoughton, Wisconsin, increase of 181,000 pounds, reporting error.

### **1991-1996 Waste Management Data for Textile Mill Products**

Table 4-17 summarizes on- and off-site waste management data for the textile mills sector for 1991, when TRI began collecting this information, and the three most recent years (1994-1996). Total production-related waste reported in this sector decreased 9.0%, from 51.6 million pounds in 1991 to 47.0 million pounds in 1996. This change reflects a larger decrease, in pounds and percent, in quantities released on- and off-site. Releases were

reported as 24.2 million pounds in 1991 and 14.9 million pounds in 1996, a 38.2% reduction. Smaller reductions (in pounds) were reported in off-site energy recovery and treatment.

Increases in all types of on-site waste management partly offset these reductions. Total on-site waste management was 22.4 million pounds in 1991 and 27.3 million pounds in 1996, an increase of 4.9 million pounds, or 22.0%. Increases ranged from 20.5% for on-site recycling to 28.4% for on-site energy recovery. However, one reporting error previously discussed in this chapter affects the 1991-1996 analysis of production-related waste; this was a 4.4 million-pound error in on-site recycling for 1996. When adjusted for this error, on-site recycling decreased by 20.3% from 1991 to 1996.

Off-site recycling increased 32.6% in this period, although this was a much smaller increase in absolute terms.

Figure 4-13 illustrates the percentage changes in on-site waste management, off-site waste management, quantities released, and total production-related waste for the textile mills sector from 1991 to 1996.

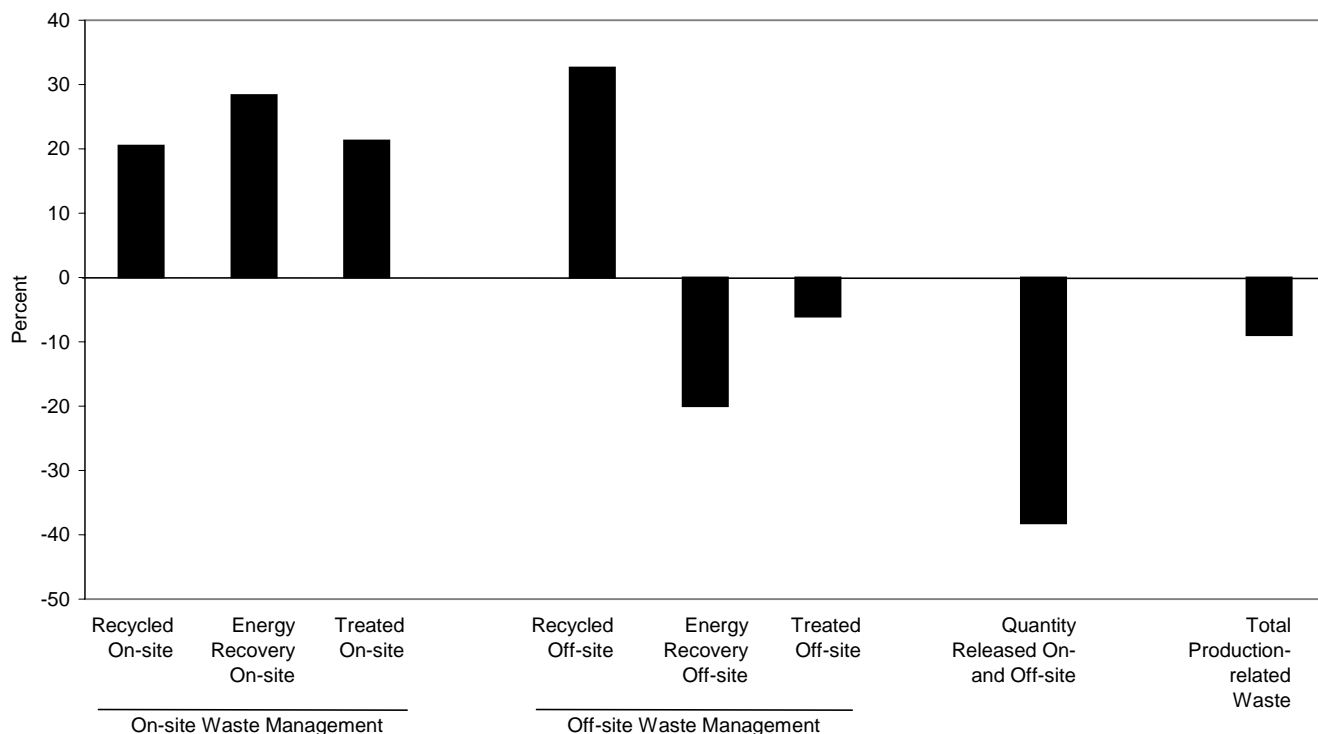
Production levels for the textile mill sector increased throughout this period, as noted earlier in this chapter. TRI facilities report absolute amounts of waste managed and of environmental releases, not adjusted for changes in production levels. Reductions in production-related waste reported to TRI were accomplished as production levels in this sector rose. Furthermore, the reductions were largely attributable to decreases reported in quantities released, the least desirable option in the waste management hierarchy (explained in Chapter 1). These changes indicate substantial improvement in the sector's management of TRI chemicals in waste.



Table 4-17. TRI Waste Management Data, 1991, 1994-1996: Textile Mill Products, SIC Code 22

Waste Management Activity	1991 Pounds	1994 Pounds	1995 Pounds	1996 Pounds
<u>On-site Waste Management</u>				
Recycled On-site	10,848,820	13,274,492	10,519,581	13,069,987
Energy Recovery On-site	3,594,145	4,001,813	4,205,406	4,613,222
Treated On-site	7,927,547	11,335,942	10,936,222	9,616,522
Total On-site Waste Management	22,370,512	28,612,247	25,661,209	27,299,731
<u>Off-site Waste Management</u>				
Recycled Off-site	734,661	730,626	720,145	974,214
Energy Recovery Off-site	2,167,180	1,237,494	1,896,966	1,733,282
Treated Off-site	2,155,617	2,333,073	2,553,964	2,025,327
Total Off-site Waste Management	5,057,458	4,301,193	5,171,075	4,732,823
Quantity Released On- and Off-site	24,152,624	16,782,600	15,606,968	14,927,994
Total Production-related Waste	51,580,594	49,696,040	46,439,252	46,960,994
Non-Production-related Waste	5,701	34,227	17,847	958
Waste Management Activity	Change 1994-1995 Percent	Change 1995-1996 Percent	Change 1991-1996 Percent	
<u>On-site Waste Management</u>				
Recycled On-site	-20.8	24.2	20.5	
Energy Recovery On-site	5.1	9.7	28.4	
Treated On-site	-3.5	-12.1	21.3	
Total On-site Waste Management	-10.3	6.4	22.0	
<u>Off-site Waste Management</u>				
Recycled Off-site	-1.4	35.3	32.6	
Energy Recovery Off-site	53.3	-8.6	-20.0	
Treated Off-site	9.5	-20.7	-6.0	
Total Off-site Waste Management	20.2	-8.5	-6.4	
Quantity Released On- and Off-site	-7.0	-4.4	-38.2	
Total Production-related Waste	-6.6	1.1	-9.0	
Non-Production-related Waste	-47.9	-94.6	-83.2	

**Note:** Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, and sulfuric acid. Data from Section 8 of Form R (Current Year, Column B) of year indicated. One facility reported incorrectly in SIC code 2269 for 1996. The facility should have reported in SIC code 2869. The incorrectly reported amounts were as follows: 4,426,812 pounds of recycling on-site, 63,392 pounds of energy recovery off-site, 10,475 pounds of treatment on-site and 51,735 pounds of quantity released on- and off-site. The percentage change from 1995 to 1996 in recycling on-site changes from 24.2% to -17.8% and from 1991 to 1996 changes from 20.5% to -20.3%.



**Figure 4-13. Percentage Change in Quantities of TRI Chemicals in Waste, 1991-1996: Textile Mill Products (SIC Code 22)**

**Note:** Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, and sulfuric acid. Data from Section 8 of Form R (Current Year, Column B) of year indicated. One facility reported incorrectly in SIC code 22 for 1996. The facility should have reported in SIC code 28. The incorrectly reported amounts were as follows: 4,426,812 pounds of recycling on-site, 63,392 pounds of energy recovery off-site, 10,475 pounds of treatment on-site and 51,735 pounds of quantity released on- and off-site. The percentage change from 1991 to 1996 in recycling on-site changes from 20.5% to -20.3%.

### Facilities with Large Increases and Decreases in Waste Management, 1991-1996

Synfin Industries in North Wales, Pennsylvania (SIC code 2262), was the top increaser for waste management with an overall 2.4 million pounds. A custom finisher of upholstery fabrics and other textiles, this facility's increase consisted wholly of an increase in on-site recycling of trichloroethylene, a processing aid. The facility contact cited a production increase as the reason for the change.

Highland Industries, Inc., in Kernersville, North Carolina (SIC code 2269), ranked second for increases with 834,000 pounds. The facility manufactures fabrics for tires, fabrics for

automotive air bags, and industrial and automotive v-belts (such as fan belts). The plant is undergoing a transition from neoprene rubber to silicone-based materials for its production of air bags. A coating process in air bag production involves the use of toluene as a solvent. In manufacturing air bags from neoprene rubber, the facility could efficiently recover toluene from solvated neoprene by carbon bed absorption. However, this is not a viable system for recovering toluene from solvated silicone. As its operations shifted to silicone, the facility installed a thermal oxidizer to treat toluene waste in air emissions. As a result, 67% of the plant's increase is accounted for by on-site treatment of toluene. On-site recycling of toluene did not decrease, however, due to a concurrent





production increase of other neoprene rubber products at the facility.

Kenyon Industries in Kenyon, Rhode Island (SIC codes 2269 and 2295 in 1991 and 2269 in 1996), ranked third for increases with 691,000 pounds. This facility is a commissioned finisher of fabrics. The primary processes involve dying and coating nylon fabric according to customer specifications. The fabrics are sold to manufacturers of commercial goods such as backpacks and luggage. Toluene, a solvent in urethane coating processes, was responsible for 94% of the facility's increase. The biggest changes for this chemical were reported in on-site treatment. Following an EPA audit of Kenyon's TRI reporting practices, the Agency provided guidance for improving estimation methods. This is cited by the facility as the primary reason for the increase.

Synthetic Finishing, Inc., in Longview, North Carolina (SIC code 2262), ranked first for decreases with an overall 3.2 million-pound reduction. Also a commissioned finisher of textile fabrics, the plant's processes include application of specialty coatings and finishes to woven and non-woven fabrics. Trichloroethylene accounted for 90% of the decrease. The chemical, used as a solvent, has been largely replaced by aqueous solutions.

Gencorp in Columbus, Mississippi (SIC code 2295), was second in decreases with a 2.0 million-pound change. Reductions in quantities released of methyl ethyl ketone accounted for 69% of the total decrease in production-related waste. This facility also ranked second in decreases of releases (see "Facilities with Large Increases and Decreases in Releases, 1988-1996"). As noted, Gencorp attributes its decreases to its conversion from organic-solvated inks to water-based inks.

Collins & Aikman in Old Fort, North Carolina (SIC code 2273 in 1991, did not report in 1996), was third for decreases with 1.8 million pounds. A

change in the reported amounts of barium compounds constituted 95% of the facility's overall reduction. Collins & Aikman manufactures automotive carpeting which is backed by a resin containing barium sulfate. Scrap carpet, trimmed from the product, was sent off-site for disposal. Beginning in 1994, the plant began shipping unfinished carpets to another facility for trimming and packaging. As a result, the Old Fort plant no longer produced the scrap waste material. Collins & Aikman in Old Fort also ranked as the third largest decreaser in releases due to a reduction in reported releases of barium compounds. See "Facilities with Large Increases and Decreases in Releases, 1988-1996," above, for more information.

#### **Other Apparent Increases and Decreases in Production-Related Waste, 1991-1996**

In the TRI database, there are other facilities with large apparent increases and decreases, which have been identified as reporting errors or plant closures. Because these are errors or plant closures and not actual changes in the data, these facilities are not discussed in detail here. There is one such facility in the textiles sector:

American & Efird, Inc., Mount Holly, North Carolina, increase of 726,000 pounds, reporting error.

#### **Facilities Contacted for Explanations (alphabetical by facility):**

3V Inc., Georgetown, South Carolina: Matt Birdsong, August 17, 1998 (explanation provided)

American & Efird, Inc., Mount Holly, North Carolina: John Eapen, August 20, 1998 (explanation provided)

Coats American, Bristol, Rhode Island: Mike Bell, August 3, 1998 (explanation provided)



#### **Chapter 4 — TRI Data for Textile Mill Products**

Collins & Aikman, Old Fort, North Carolina:  
Pat McCabe, August 5 and August 17, 1998  
(explanation provided)

Dixie Yarns, Inc., Chattanooga, Tennessee:  
Don Huffman, August 17, 1998 (explanation  
provided)

Excello Fabric Finishers, Inc., Coshocton,  
Ohio: Jerry Stenner, August 4, 1998  
(explanation provided)

Fieldcrest Cannon Inc., Kannapolis, North  
Carolina: Josh Chandler, August 13, 1998  
(explanation provided)

Fil-Tec, Inc., Cavetown, Maryland: Andy  
Dubnik, August 24, 1998 and Ted Schoek,  
September 8 and September 9, 1998  
(explanation provided)

Gencorp, Columbus, Mississippi: Mike  
Stierwalt, August 3, 1998 (explanation  
provided)

Highland Industries, Inc., Kernersville, North  
Carolina: Gary Voss, August 4, 1998 and Earl  
Crouch, August 5, 1998 (explanation provided)

Kenyon Industries, Inc., Kenyon, Rhode Island:  
Barbara Burdick, August 13, 1998 (explanation  
provided)

Neese Coated Fabrics, Saint Louis, Missouri:  
Plant Closure. No contact person available.

Paxar Corporation, Orangeburg, New York:  
Kevin Finnegan, August 11 and August 27,  
1998 (no explanation provided)

Reeves Brothers, Inc., Buena Vista, Virginia:  
Plant closure. No contact person available.

Reeves International, Rutherfordton, North  
Carolina: Robert H. Emmel, Ph.D., August 27,  
1998 (explanation provided)

Synfin Industries, North Wales, Pennsylvania:  
Bert Ross, August 3, August 27, September 8,  
and September 15, 1998 (explanation provided)

Synthetics Finishing, Inc., Longview, North  
Carolina: Mark Stultz, August 5, 1998  
(explanation provided)

Uniroyal Engineered Products, Port Clinton,  
Ohio: Jeffrey A. Hinchman, August 27, 1998  
(explanation provided)

Uniroyal Engineered Products, Stoughton,  
Wisconsin: Frank Krawcek, August 18, 1998  
(explanation provided)

